



Dear Customers and Colleagues:

As I reflect on the past year, three core themes shape the direction of the National Highway Institute—raising our training standards, advancing knowledge and learning, and improving customer service.

This year we became an authorized provider of International Association of Continuing Education and Training (IACET) continuing education units (CEUs). IACET is an independent, non-profit association whose goal is to ensure quality continuing education for professionals, and the high standards espoused by IACET are compatible with NHI’s training approach. Recognition by IACET assures both our course participants and their employers that taking an NHI course will be a valuable use of limited training dollars.

Advancing knowledge and learning is the essence of what we do. Our training programs are offered to all members of the transportation community; our partnerships leverage resources, minimize duplication and promote our products; and we continue to explore varied delivery methods. Introduced last year, we will continue to offer FasTrack—shorter training offerings developed in a compressed timeline—in cooperation with our FHWA Program Office staff and Technical Service Teams. We also ventured into Web Conferencing as a method of providing “just in time” information on programs, policies and technical guidance to large audiences, as well as formal training and tutorials. We’re pleased that the demand exceeded our expectations and plan to continue this service for our customers.

Further, we have expanded distribution of NHI course materials to other countries, university transportation centers and academic programs, Local and Tribal Technical Assistance Programs, transportation and engineering associations, and the private sector, resulting in tremendous savings to these organizations.

We are committed to continuous process improvement, especially in the area of customer service. We continually explore ways to reduce the course development timeline and have several initiatives currently underway. These include more frequent communication with our Contracting Office; an NHI Tool Kit for our course development contractors which includes an NHI Style Guide, Section 504/508 Guidance, and samples of course materials; and use of project tracking software to monitor the course development process. We recruit highly qualified on-site contract staff—with expertise in distance learning and instructional systems design—who can provide in-house support. We welcome your input on how we can better serve you.

We appreciate your continued support and feedback so that we can effectively address the training needs of the transportation workforce.

Sincerely,

Moges Ayele, Ph.D.
Director, National Highway Institute

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Mathematical Science

Course Number: 123002A

Course Title: Scientific Approaches to Transportation Research

Fee: \$460 Per Participant **Length:** 3.5 Days (CEU: 2.1 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course addresses professional and ethical practices for managing, conducting, and evaluating research programs and projects. Participants will learn about the critical elements in the research process, turning research objectives into research hypotheses, testing of the hypotheses and evaluation of the results. The course will look at the scientific method as well as the management and handling of data as it applies to transportation research.

Outcomes:

Upon completion of the course, participants will be able to:

- Recognize the differences between applied, basic, and development research.
- List the tradeoffs between the risk (cost) and benefits of engaging in research.
- Identify the steps in the research process and sequence of scientific inquiry.
- Discuss issues with experiment design, e.g., types of research investigation and principles of data collection.
- Discuss how and why probability distributions are used in statistics.
- Discuss hypothesis testing and Statistical Inference and apply linear regression methods.
- Discuss when and how to apply common nonparametric statistics.

Target Audience:

Transportation engineers, research managers and researchers who are involved in the design, development and implementation of transportation research. Participants should have, at a minimum, a limited exposure to basic statistics and research practices.

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Structures

Course Number: 130053A

Course Title: Bridge Inspection Refresher Training

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 30
This course will be completely revised for 2005. The major goals of the updated course are: refresh the skills of practicing bridge inspectors in fundamental visual inspection techniques; review the background knowledge necessary to understand how bridges function; communicate issues of National significance relative to the Nation's bridge infrastructure; re-establish proper rating practices and review the professional obligations of bridge inspectors.

Description:

This course is based on the "Bridge Inspector's Reference Manual" 2002 with reference to the AASHTO Manual for the Condition Evaluation of Bridges, 2000, with interims, the FHWA Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges, 1995, including 2003/2004 errata sheet, and the AASHTO Guide for CoRe (Commonly Recognized) Structural Elements, 1998 with interims.

CORE COURSE TOPICS include: Tri-axial Constraints, Inspector Qualifications and Duties, Recordkeeping and Documentation, Structure Inventory and Appraisal Overview, National Bridge Inventory Standard Component Ratings, Element Level Ratings, Safety, Component Case Studies for Decks, Superstructures, Substructures, and Channels, and a Virtual Bridge Inspection Classroom Exercise.

OPTIONAL TOPICS include: Bridge Mechanics, Superstructure Type Identification, Inspection Techniques, Fatigue and Fracture in Steel Bridges, Traffic Safety Features, Bridge Site Signing, and Culverts. Host agencies desiring additional information on selection of optional topics and options for addressing NBI rating methods and element level data collection should contact Eric Mann of Michael Baker Corporation at (412) 269-7932.

Outcomes:

Upon completion of the course, participants will be able to:

- Perform bridge safety inspection, component or element level condition ratings, functional appraisal, and data collection in a uniform manner consistent with NBIS and agency requirements.
- Apply current inspection techniques.
- Evaluate channel scour as applied to waterway ratings.
- Collect field data with appropriate precision.

Target Audience:

Federal, State, local agency, and private sector personnel employed in inspecting bridges or managing bridge inspection programs. Participants must have completed NHI Course No. 130055 - Safety Inspection of In-Service Bridges, or meet the criteria for a bridge inspector under the State's procedures or requirements.

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NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Structures

Course Number: 130054A

Course Title: Engineering Concepts for Bridge Inspectors

Fee: \$650 Per Participant **Length:** 5 Days (CEU: 3 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course prepares technicians and other personnel who have a limited knowledge of bridge engineering for a more intensive course in bridge inspection, such as the 2-week NHI Course No. 130055 - Safety Inspection of In-Service Bridges. This course provides knowledge of the elementary concepts in bridge engineering that are needed by bridge inspectors. Materials, material properties, bridge components and details, loadings, stresses and strains, and deterioration of bridge materials and members are covered. The course concludes with an examination reviewing key elements of bridge engineering.

Outcomes:

Upon completion of the course, participants will be able to:

- Identify common bridge types, recognize and name the typical major components and members of a highway bridge and also the members and features unique to bridges such as trusses, arches, cable-stayed and suspension spans.
- Name the common materials used in bridges and describe the basic properties, strengths and weaknesses of each.
- Discuss the basic concepts of elasticity of materials, response of materials and structural members to a variety of loadings, and the relationship between stresses and strains.
- Describe the various types of deterioration of the common structural materials that result from weathering, loading, and etc.
- Recognize the more common signs of material distress such as steel corrosion and cracking and concrete cracking, spalling and scaling.
- Name the secondary elements and features of bridges such as joints, railings, scuppers, etc., and describe the proper role of each in the performance of a bridge.
- Demonstrate knowledge of bridges, bridge components, material properties and mechanics of materials to prepare to take a comprehensive course on bridge inspection.

Target Audience:

Federal, State, and local technicians, inspectors and engineers with basic experience relating to highway bridges. Individuals completing this course could serve on a bridge inspection team, but would require additional experience and training to qualify as a team leader.

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NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Structures

Course Number: 130055A

Course Title: Safety Inspection of In-Service Bridges

Fee: \$1400 Per Participant **Length:** 10 Days (CEU: 6 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course is based on the new "Bridge Inspector's Reference Manual," providing training on the safety inspection of in-service highway bridges. Satisfactory completion of this course will fulfill the training requirements of the National Bridge Inspection Standards (NBIS) for a comprehensive training course. Mid-term and final examinations based on course content will be administered to participants. The sponsoring Agency/State may monitor the examinations and retain the scores to qualify or certify bridge inspectors. The sponsoring agency is responsible for grading the examinations. An answer key is provided.

Outcomes:

Upon completion of the course, participants will be able to:

- Evaluate a variety of bridges and determine the critical areas for inspection including fracture-prone details, and common points of deterioration and/or distress.
- Review as-built plans and previous inspection reports and, based on this review, plan and conduct an effective safety inspection for common bridge types and bridge-length culverts.
- Provide documentation of defects in various materials and of bridge configurations.
- Recognize the need to inspect the underwater portions of bridge structures; describe the types of deficiencies to look for (e.g., scour); determine when an inspection is necessary; and identify the procedures and types of equipment available and the advantages and limitations of each.
- Evaluate the severity of material deterioration and member distress and assign ratings according to coding guidance as developed by FHWA and/or the State highway agency. Determine when it is necessary to close the bridge (or recommend closure) because of imminent danger.
- Discuss the equipment requirements for a complete inspection and demonstrate proficiency.
- Recognize when further inspection, such as Non-Destructive Testing (NDT), is required beyond the usual visual and hand tool inspection and decide what type of further inspection should be conducted.

Target Audience:

Federal, State, and local highway agency employees involved in inspecting bridges or in charge of a bridge inspection unit. A background in bridge engineering or completion of NHI Course No. 130054 - Engineering Concepts for Bridge Inspectors is strongly recommended.

Technical Information	Tom Everett	(410) 962-3743 tom.everett@fhwa.dot.gov
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Structures

Course Number: 130060A

Course Title: Vessel Collision Design of Highway Bridges

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

Description:

The AASHTO Guide Specification and Commentary for Vessel Collision Design of Highway Bridges was developed to enable bridge engineers to assess the risk of vessel collision with a bridge, calculate the costs of probable collisions with the bridge, develop plans to minimize the risk of collision, and develop designs to protect the bridge and its motorists in the event of a collision. This 2-day training course provides bridge engineers with the background and overall approach of the design specification. Bridge engineers will be trained on the detailed application of those specifications through the use of a typical design situation. The course covers the following subjects:

- Background and Historical Collisions
- General Provisions
 - To include: applicability of the specification, data collection, bridge importance classification, vessel types and characteristics, design vessel, design impact speed/vessel collision energy, collision force on piers and superstructures, ship and barge bow damage, depth and impact load combination and location of forces
- Design Vessel Selection
 - To include: waterway/bridge/vessel characteristics, impact distribution, design loads, selection methods (semi-deterministic, risk analysis and cost-effectiveness)
- Substructure Provisions
- Concrete and Steel Design
- Bridge Protection Design Provisions and Planning Guidelines
 - To include: physical protection (fixed and moveable bridges), motorist warning systems/aids-to-navigation

Outcomes:

Upon completion of the course, participants will be able to:

- Apply the AASHTO vessel collision specification to design bridge structures.
- Determine ship and barge characteristics for vessels transiting a waterway.
- Compute vessel impact forces and collision energies.
- Determine the location of impact forces on bridge members.
- Determine design impact loads using Method I (semi-deterministic) criteria, Method II (risk analysis) criteria and Method III (benefit/cost) criteria.
- Describe alternative pier protection systems for bridge structures.
- Apply vessel collision planning guidelines for the development of new bridges.

Target Audience:

Federal, State, and local highway bridge design engineers and bridge managers who are responsible for the construction of bridges over marine or inland waterways navigable by large commercial vessels. It will also be of interest to other parties who are responsible for the management of inland waterway, port, and navigation facilities or for the operation of merchant vessels.

Technical Information	Benjamin Tang	(202) 366-4592 benjamin.tang@fhwa.dot.gov
NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Structures

Course Number: 130069A

Course Title: Hazardous Bridge Coatings: Design and Management of Maintenance and Removal Operations

Fee: \$530 Per Participant **Length:** 4 Days (CEU: 2.4 Units) **Class Size:** Minimum 20; Maximum 28

Description:

The focus of this training course is on the maintenance or removal of bridge paint systems that contain lead or other potentially toxic materials. In compliance with applicable regulations, the course offers a step-by-step method for the design, specification, and management of bridge painting projects. The classroom presentation includes a combination of lectures and discussions, demonstrations of key methods and procedures, and workshops. In addition, each participant receives a field guide containing a detailed project design checklist, a model/template specification, a suggested contractor pre-qualification package, and a pre-bid meeting agenda, a submittal review checklist, as well as an environmental, health, and safety checklist.

Outcomes:

Upon completion of the course, participants will be able to:

- Recognize the health hazards and legal risks associated with lead-containing paint and the impacts on bridge painting programs.
- Use coating assessment surveys to maximize the service life of individual coating systems and improve the cost-effectiveness of an overall bridge painting program.
- Select appropriate combinations of removal methods and containment systems based upon the chosen painting strategy and the relative risks of the paint disturbance operation to workers, the public and the environment.
- Implement a monitoring program that adequately demonstrates that associated risks have been controlled.
- Establish performance standards to protect workers, reduce long-term liabilities associated with hazardous wastes, and document successful clearance of project sites.
- Prepare clear, well organized, performance-based, project-specific specifications which establish objective goals for all areas of contract performance but leave the means and methods of construction to the contractor.
- Use available tools to help pre-qualify contractors, conduct effective pre-bid meetings, review contractor submittals, and enforce project specifications.

Target Audience:

Highway and transportation agency employees and private industry personnel who are responsible for development of contract specifications and procurement requirements for the removal and/or maintenance of bridge paint systems. Training applicable to managers who are responsible for procurement approval and for other personnel involved in such operations.

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NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Structures

Course Number: 130078A

Course Title: Fracture Critical Inspection Techniques for Steel Bridges

Fee: \$460 Per Participant **Length:** 3.5 Days (CEU: 2.1 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course replaced NHI Course No. 13036 - Inspection of Fracture Critical Bridge Members. The curriculum has been upgraded to reflect current practices and address new and emerging technologies available to bridge inspectors. In addition, the course has been reformatted and expanded to include exemplary training and hands-on workshops for popular types of Non-Destructive Testing (NDT) equipment and a case study for the preparation of an Inspection Plan for a fracture critical bridge.

Day 1 of the course focuses on the concept of Fracture Critical Members (FCMs), FCM identification, failure mechanics and fatigue in metal. These fundamentals are followed by an overview of NDT methods. Day 2 provides demonstration sessions and hands-on applications of NDT techniques for Dye Penetrant, Magnetic Partial Testing, Eddy Current, and Ultrasonic Testing. Days 3 and 4 emphasize inspection procedures and reporting for common FCMs including problematic details, I-girders, floorbeams, trusses, box girders, pin and hanger assemblies, arch ties, eyebars and cross girders/pier caps. A case study of the preparation of an inspection plan of a fracture critical bridge closes out the presentation. The course includes daily participant assignments. The schedule can be tailored to specific agency requirements.

Outcomes:

Upon completion of the course, participants will be able to:

- Identify fracture critical bridges, fracture critical bridge members, and fatigue prone details.
- Categorize contributing factors in the initiation and propagation of fatigue cracks.
- Perform an intensive, in-depth and thorough Fracture Critical Member inspection.
- Identify various crack types and assess their impact on the performance of the member.
- Evaluate, select and facilitate the use of available NDT methods.
- Recommend a necessary course of action based on inspection findings.

Target Audience:

Those benefiting most from this training will be public and private sector bridge inspectors, supervisors, project engineers, maintenance engineers, shop inspectors, shop foremen, and others responsible for shop fabrication and field inspection of fracture critical steel bridge members. Participants should have completed NHI Course No. 130054 - Engineering Concepts for Bridge Inspectors and/or NHI Course No. 130055 - Safety Inspection of In-Service Bridges, or possess equivalent field experience relative to bridges to fully understand bridge mechanics and bridge safety inspection procedures as required by the National Bridge Inspection Standards.

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Structures

Course Number: 130079A

Course Title: Bridge Coatings Inspection

Fee: \$530 Per Participant **Length:** 4 Days (CEU: 2.4 Units) **Class Size:** Minimum 20; Maximum 30

Description:

The focus of this training course is on inspection of surface preparation and application of protective coating systems for bridge and highway structures, including navigation through the State's painting specification. The course provides a basic overview of the theory of corrosion and its control, the characteristics of various bridge coating types, as well as surface preparation and coating application techniques and equipment. Sessions on understanding coating specifications and diagnosing premature coating failures are also included. The classroom presentation includes a combination of lectures and discussions, demonstrations of surface preparation, coating application and inspection equipment, and hands-on workshops.

Outcomes:

Upon completion of the course, participants will be able to:

- Define the components of a corrosion cell and the methods in which protective coatings inhibit the corrosion process.
- Describe the components of an industrial coating, the four basic curing mechanisms, and the advantages and limitations of protective coatings systems for bridge and highway structures.
- Identify methods for surface preparation and describe the advantages and limitations of each.
- Interpret SSPC and NACE surface preparation specifications.
- Use coating manufacturers' product data sheets to ensure proper coating mixing, thinning and application.
- Identify methods of coating application and describe the advantages and limitations of each.
- Describe the importance of quality assurance inspection of surface preparation and coating application operations on bridge structures.
- Calibrate and use coatings inspection gauges and industry standards.
- Describe the content of a pre-job conference.
- Describe the basic format and content of a painting specification and identify the key items in the State's painting specification and/or special provisions.
- Describe quality assurance documentation procedures.
- Identify coating maintenance options and determine the overcoatability of an existing coating system.
- Identify the causes of premature coating failures, methods of prevention and resolution.
- Recognize basic safety hazards associated with inspection of protective coatings.
- Describe the basic controls used to help prevent environmental contamination during surface preparation and coating application operations.

Target Audience:

Highway and transportation agency employees and private industry personnel who are responsible for the on-site inspection of protective coating systems during their installation by outside painting contractors or by State personnel. Training is also applicable to management and bridge inspection.

Technical Information	Bob Kogler	(202) 493-3080 bob.kogler@fhwa.dot.gov
NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Structures

Course Number: 130082A

Course Title: LRFD for Highway Bridge Substructures and Earth Retaining Structures

Fee: \$530 Per Participant **Length:** 4 Days (CEU: 2.4 Units) **Class Size:** Minimum 20; Maximum 30

This new course expands the suite of FHWA services intended to assist States and local governments in a transition to, and implementation of LRFD. The course promotes the LRFD design platform and establishes the motivation for LRFD as the reassurance that safe design practice is being applied where it is needed. Course curriculum is based on the AASHTO Load Resistance Factor Design (LRFD) Bridge Standard Design Specifications 3rd Edition 2004.

Description:

The course includes LRFD theory applied to design examples and illustrates step-by-step LRFD design procedures through a series of detailed process flowcharts. The course design includes the extensive use of student exercises and example problems to demonstrate overall design, detailing and construction principles addressed in the reference materials.

The course material includes a comprehensive Reference Manual, lecture and workshop exercises intended to promote or enhance a working knowledge of the AASHTO LRFD Specification, and a Participant Workbook for lecture notes and exercises. The curriculum follows the AASHTO 3rd Edition as noted above for structural applications, while the geotechnical curriculum follows revisions based on recent development work on the AASHTO LRFD Standard Design Specification Section 10, Foundations. These revisions are referenced in the curriculum as AASHTO PROPOSED CHANGES, and are scheduled for AASHTO ballot in 2005.

Course participants will acquire hands-on experience in the design and detailing of bridge abutment and pier elements, deep and shallow foundation design, and earth retaining structure design and detailing, in accordance with the current AASHTO specifications. The student exercises and examples are based on components of overall comprehensive bridge design examples using LRFD and demonstrate comparisons between ASD, LFD and LRFD design methods where meaningful.

Outcomes: Upon completion of the course, participants will be able to demonstrate the following skills relative to various bridge abutments, piers, retaining walls and foundations:

- Define LRFD limit states and compute structural and geotechnical design loads.
- Apply LRFD criteria for design.
- Integrate the LRFD specification provisions into the host agency's current practice.
- Integrate the geotechnical aspects of LRFD foundation design into LRFD structural design.
- Successfully complete a comprehensive final exam.

Target Audience:

The primary target audience for the course is mid-level bridge and geotechnical journeymen or mid-level design engineers with 0-5 years of experience responsible for the structural and/or geotechnical design of bridge substructures, and retaining walls. The course can accommodate a blend of entry-level designers with college LRFD experience, experienced Load Factor Design (LFD) designers with no LRFD experience, and experienced LFD designers with minimal LRFD experience.

Technical Information	Firas Ibrahim	(202) 366-4598 firmas.ibrahim@fhwa.dot.gov
	Jerry DiMaggio	(202) 366-1569 jerry.dimaggio@fhwa.dot.gov
NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Structures

Course Number: 130087A

Course Title: Inspection and Maintenance of Ancillary Highway Structure

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course provides training in the inspection and maintenance of ancillary structures, such as structural supports for highway signs, luminaries, and traffic signals. Its goal is to provide agencies with information to aid in establishing and conducting an inspection program in accordance with the FHWA Guidelines for the Installation, Inspection, Maintenance, and Repair of Structural Supports for Highway Signs, Luminaries, and Traffic Signals.

Outcomes:

Upon completion of the course, participants will be able to:

- List and identify common visible weld defects.
- Identify appropriate non-destructive testing techniques.
- Identify factors that lead to corrosion and explain mitigation methods used in ancillary structures.
- Define the severity of observed defects in accordance with the FHWA Guidelines.
- Identify defects in base/anchor bolt installations.
- List key issues in construction inspection of ancillary structures.
- Identify repair techniques and discuss their use.

Target Audience:

Structural engineers, material engineers, traffic engineers, field inspectors, construction supervisors, maintenance personnel and other technical personnel involved in the installation, inspection, maintenance, and repair of ancillary highway structures. This course is not a design course; however, the information should be helpful to those working in design and specification of ancillary structures.

Technical Information	Tom Everett	(410) 962-3743 tom.everett@fhwa.dot.gov
NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Structures

Course Number: 130090A

Course Title: Introduction to Tunnel Engineering

Fee: \$200 Per Participant **Length:** 1 Day (CEU: 0.6 Unit) **Class Size:** Minimum 20; Maximum 30

Description:

This new course is designed as an introduction to the fundamentals of tunnel engineering, including tunnel design, construction, inspection, maintenance and rehabilitation of a wide variety of tunnels. It includes practical information on tunnel geology, classifications, ventilation, lighting, fire protection, and emergencies.

Outcomes:

Upon completion of the course, participants will be able to:

- Explain the phases of exploration before tunnel construction.
- Classify various types of tunnels, and explain critical issues associated with each type.
- Describe, in general terms, the steps in tunnel construction.
- Explain critical issues associated with the following, as they relate to tunnel construction: ventilation, lighting, fire protection, finishes, and emergencies plans.
- List and explain the major steps in tunnel inspection, maintenance, and repairs.

Target Audience:

Public and private sector engineers, maintenance workers, and designers involved with all aspects of tunnel engineering. This 1-day course is an introduction to tunnels, assuming little or no prior work experience in the area.

Technical Information	Jesus Rohena	(410) 962-2453 jesus.rohena@fhwa.dot.gov
NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Pavements and Materials

Course Number: 131023A

Course Title: Highway Materials Engineering

Fee: \$4700 Per Participant **Length:** 30 Days (CEU: 18 Units) **Class Size:** Minimum 20; Maximum 30

A prospective participant must have a solid academic background in mathematics and science.

Description:

This course provides applied knowledge in highway engineering materials and quality control. Coverage includes (1) materials control and acceptance-quality assurance; (2) soil and foundations; (3) steels, welding, and coatings; (4) aggregates and unbound bases; (5) asphalt materials and paving mixtures; and (6) Portland Cement Concrete.

Outcomes:

Upon completion of the course, participants will be able to:

- Identify and describe the characteristics and engineering properties of the materials utilized in highways.
- Identify and describe the selection and important design properties of highway materials.
- Describe the important steps and considerations in the mix design procedures.
- Demonstrate an understanding of materials quality assurance and be able to develop an effective materials acceptance plan.
- Describe the field and laboratory testing procedures and the significance of test results, along with their relationship to laboratory designs.
- Describe the issues and trends of importance to State DOT materials engineering personnel.

Target Audience:

State DOT engineers who require a basic knowledge of highway materials. The typical participant will have an undergraduate degree in engineering or equivalent engineering experience in the highway field. These individuals typically will be staff professionals, who either have been assigned or have the potential to be assigned to responsible positions in the highway materials field, such as district or regional materials engineer, or an engineer in the materials central office operations.

Technical Information	Michael Rafalowski	(202) 366-1571 michael.rafalowski@fhwa.dot.gov
NHI Training Program Manager	John Taylor	(703) 235-0524 john.taylor@fhwa.dot.gov

Pavements and Materials

Course Number: 131026A

Course Title: Pavement Subsurface Drainage Design

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 30

Description:

The course provides detailed information concerning pavement subsurface drainage design for new or reconstructed Portland Cement Concrete (PCC) or Asphalt Concrete (AC) pavements and retrofit edge drains. This course teaches cost-effective design methods, including permeable bases and edge drains where appropriate, to prevent or minimize moisture related distress to pavements.

Outcomes: Upon completion of the course, participants will be able to:

- Evaluate the need for subsurface drainage systems for existing pavements or new pavement designs.
- Design subsurface drainage systems for Portland Cement Concrete and Hot-Mix Asphalt pavements.
- Explain the guidelines for developing plans and specifications for subsurface drainage systems.
- Develop monitoring and maintenance programs for pavements with subsurface drainage systems.

Target Audience:

The course is directed to Federal, State and local highway engineers, designers, and personnel involved in hydraulic design, materials control, pavements design, research, construction and maintenance of pavement subsurface drainage systems.

Technical Information	Angel Correa	(404) 562-3907 angel.correa@fhwa.dot.gov
NHI Training Program Manager	John Taylor	(703) 235-0524 john.taylor@fhwa.dot.gov

Pavements and Materials

Course Number: 131029A

Course Title: AASHTO Pavement Overlay Design

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 30
The hosting agency must provide 15 computers with the following minimum requirements: 486DX Processor, 8 MB RAM, 100 MB Hard Disk, 3.5" Floppy Disk Drive, Windows 95, VGA Graphics Card, Excel 5.0, and AASHTOWare DARWin 3.0. One or more printers is also required. "AASHTOWare" and "DARWin" are trademarks of the American Association of State Highway and Transportation Officials (AASHTO).

Description:

A variety of instructional techniques are employed, including lecture and discussion with visual aids, case studies, and workshops facilitated by hands-on usage of appropriate computer software packages. Participants will receive a copy of the course notes which should serve as a valuable future reference on this subject. The course focuses on Part III, Chapters 1, 2, 3, and 5 (as revised) of the "AASHTO Guide for Design of Pavement Structures." Participants will need to furnish their own 1993 "AASHTO Guide for Design of Pavement Structures."

Outcomes:

Upon completion of the course, participants will be able to:

- Describe the significance of various items for consideration in the development of various overlay strategies, including overlay materials, preoverlay repair, subdrainage, milling and recycling, causes of existing pavement deterioration, and others.
- List the procedures and considerations for determining overlay design input parameters, including design serviceability loss, overlay design reliability, effective design subgrade resilient modulus, pavement condition adjustment factors, and others.
- Design any of the following type of overlays, given a set of design conditions, using the condition survey method (and the remaining life method for applicable overlay types):
 - Asphalt overlay of fractured Portland Cement Concrete (PCC) pavement.
 - Asphalt overlay of PCC pavement.
 - Asphalt overlay of an AC/PCC pavement.
 - Unbonded concrete overlay of a PCC or AC/PCC pavement.
 - Concrete overlay of an AC pavement.

Target Audience:

Highway engineers who have pavement design and analysis responsibilities. A working knowledge of pavement design and associated engineering principles is desirable.

Technical Information	Mark Swanlund	(202) 366-1323 mark.swanlund@fhwa.dot.gov
NHI Training Program Manager	John Taylor	(703) 235-0524 john.taylor@fhwa.dot.gov

Pavements and Materials

Course Number: 131032A

Course Title: Hot-Mix Asphalt Construction

Fee: \$335 Per Participant **Length:** 2.5 Days (CEU: 1.5 Units) **Class Size:** Minimum 20; Maximum 30

This course is designed for an audience of both highway agency and contractor personnel. The host agency should make every effort to ensure such a mix of participants in the course.

Description:

This training course is the result of a partnership between American Association of State Highway and Transportation Officials (AASHTO), Federal Highway Administration (FHWA), and the Hot-Mix Asphalt (HMA) Industry. It was developed through the cooperative efforts of the Joint AASHTO/FHWA/Industry Training Committee on Asphalt. It combines lectures and problem solving workshop sessions to provide participants with a working knowledge of the hot-mix asphalt construction process and equipment. The course is designed to help participants understand the effect of construction actions on the final product. This program reviews the entire HMA construction process beginning with the delivery of the HMA to the job site, through lay down and compaction, and concluding with quality control/quality assurance (QC/QA) of the completed pavement. To emphasize recommended good practice in HMA construction, various exercises are used, including troubleshooting typical field problems. The course concludes with an examination that reviews the key elements of HMA construction.

Outcomes: Upon completion of the course, participants will be able to:

- Describe the purpose of project documents, pre-construction and pre-paving conferences, and cooperative communications on the job.
- List the steps involved in preparing bases and existing pavements for overlays.
- Select correct patching materials and placement techniques for pavement repair.
- Define a proper HMA delivery process to the job site.
- Explain the effect of the various components of a HMA paving machine on the finished mat.
- Describe how to make a good longitudinal or transverse joint.
- Identify QA techniques that apply to the HMA construction.

Target Audience:

This course is designed for an audience that contains 50 percent contractor supervisory personnel and 50 percent Federal, State, and local highway agency construction engineers and field inspectors involved in the planning, construction, and review of HMA placement projects. It is important that such a mix of participants is present. Participants are required to bring a calculator.

Technical Information	Chris Newman	(202) 366-2023 christopher.newman@fhwa.dot.gov
	Matthew Corrigan	(202) 366-1549 matthew.corrigan@fhwa.dot.gov
NHI Training Program Manager	John Taylor	(703) 235-0524 john.taylor@fhwa.dot.gov

Pavements and Materials

Course Number: 131033A

Course Title: Construction of Portland Cement Concrete Pavements

Fee: \$335 Per Participant **Length:** 2.5 Days (CEU: 1.5 Units) **Class Size:** Minimum 20; Maximum 30

Description:

The course provides participants with an overview of the entire Portland Cement Concrete (PCC) paving process: setting forms, hauling, curing and grinding concrete, and joint sealing. This course is presented in four modules:

- Plant Operations: Truck Mixed Concrete and Central Mixed Concrete,
- Paving Operations: Slipform Paving and Fixed-form Paving,
- Saw and Seal Operations, and
- Concrete Pavement Restoration (CPR) Operations.

The course is designed to allow presentation of all or some of the modules at the discretion of the host agency. The course focuses on the proper methods for construction of concrete paving with an emphasis on cause and effect.

Outcomes:

Upon completion of the course, participants will be able to:

- Describe the differences between truck-mixed and ready-mixed concrete.
- Identify factors in production and paving operations that contribute to achieving a smooth ride.
- Describe the differences between slip-form and fixed-form paving.
- Identify the factors that impact saw timing and crack control.
- Recognize the key factors in placing joint sealant materials.
- Identify the components of concrete pavement restoration application and construction techniques.

Target Audience:

This course is intended for upper- and mid-level highway agency professionals who are responsible for pavement preservation and management.

Technical Information	Michael Rafalowski	(202) 366-1571 michael.rafalowski@fhwa.dot.gov
NHI Training Program Manager	John Taylor	(703) 235-0524 john.taylor@fhwa.dot.gov

Pavements and Materials

Course Number: 131035A

Course Title: Pavement Management Systems (PMS) (not currently offered)

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** N/A

This course is not being scheduled, but course materials are available through the NHI Training Program Manager. "NHI Course No. 131105 - Analysis of Pavement Management Systems Data for Engineering Applications" is available for scheduling.

Description:

This course provides participants with an overview of PMS and describes the basic components of a PMS, from the most basic to the most complex systems. It outlines the step-by-step methodology for developing, implementing and maintaining a PMS. The course identifies key elements such as relational databases, automated data collection equipment, and multi-year prioritization. The course is divided into modules as follows: Fundamental Database Systems Inventory, History and Location Referencing Systems, Pavement Conditions Surveys, Pavement Distress Indices, ESAL Flow Maps in PMS, Multi-year Prioritization, Feedback Process, and Implementation and Institutional Issues.

Outcomes:

Upon completion of the course, participants will be able to:

- Describe the basic concepts of Pavement Management.
- Identify PMS goals for agency top management.
- Determine their agency's needs and identify the products that will best serve those needs.
- Develop, implement and operate a PMS.
- Coordinate all PMS activities within the agency.
- Discuss institutional issues concerning PMS.

Target Audience:

This course is designed for PMS practitioners at the engineering and management levels.

Technical Information	Frank Botelho	(202) 366-1336 frank.botelho@fhwa.dot.gov
NHI Training Program Manager	John Taylor	(703) 235-0524 john.taylor@fhwa.dot.gov

Pavements and Materials

Course Number: 131044A

Course Title: Hot-Mix Asphalt Production Facilities

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

The course is designed for an audience of both highway agency and contractor personnel. Host agencies should make every effort to ensure that such a mix of participants in the course.

Description:

This training course combines lectures and workshop sessions to provide participants with a working knowledge of Hot-Mix Asphalt (HMA) Production Facilities. The training program is the result of a partnership between the American Association of State Highway and Transportation Officials (AASHTO), the Federal Highway Administration (FHWA), and the HMA Industry. This course covers the entire HMA Production Facilities process and addresses the following topics: types of plants, drying and heating systems, emission control systems, feeders and conveyor systems, storage systems, plant operation and maintenance, quality control and quality assurance. It concludes with an examination that emphasizes the key elements of HMA Production Facilities.

Outcomes: Upon completion of the course, participants will be able to:

- Define the roles and responsibilities of each person at the HMA Production Facility.
- Identify the different types of plants, the main components of each, and how these components interact.
- Describe the materials control process and its effect on the quality of the final product.
- Differentiate between acceptable and non-acceptable methods of plant operation and maintenance.
- Explain the operation of the exhaust fan and emission control systems and discuss their importance.
- Identify potential problems that may occur during production and develop specific solutions to those problems.

Target Audience:

This course is designed for project engineers, lead inspectors, plant supervisors, and all others involved with the HMA plant production. This course is designed for an audience that is a mix of contractor/producer personnel along with Federal, State, and local highway agency personnel. Participants are required to bring a calculator.

Technical Information	Chris Newman	(202) 366-2023 christopher.newman@fhwa.dot.gov
	Matthew Corrigan	(202) 366-1549 matthew.corrigan@fhwa.dot.gov
NHI Training Program Manager	John Taylor	(703) 235-0524 john.taylor@fhwa.dot.gov

Pavements and Materials

Course Number: 131045A

Course Title: Hot-Mix Asphalt Materials, Characteristics and Control

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This training course is the result of a partnership between the American Association of State Highway and Transportation Officials (AASHTO), Federal Highway Administration (FHWA), and the Hot-Mix Asphalt (HMA) Industry. It was developed through the cooperative efforts of the Joint AASHTO/FHWA/Industry Committee on Asphalt. It combines lectures and problem solving workshop sessions to provide participants with a working knowledge of hot-mix asphalt materials, their characteristics and controls. The course focuses on two areas. The first provides technical information on the material properties of HMA, the processes used to measure these properties, and the effect that these properties have on the final, compacted pavement. The second involves achieving these properties in the field, with discussions on quality management, and analyzing the impact of segregation and density on HMA pavement performance. The course concludes with an examination that reviews the key elements of HMA materials, characteristics and control.

Outcomes: Upon completion of the course, participants will be able to:

- Identify the various and desirable properties of asphalt, aggregates, and mixtures.
- Describe the proper procedures for handling, storing, sampling and testing the materials.
- Distinguish between desirable and undesirable results of tests used for controlling and analyzing the quality of HMA.
- Select the processes and procedures that ensure the quality of HMA pavements.

Target Audience:

The course is designed for an audience directly involved in the production and construction of hot-mix asphalt pavements. This includes contractor personnel at both the production facility and on the pavement lay down site, and owner/agency personnel involved with the inspection of HMA pavement construction. Also, the course is designed for an audience that is a mix of contractor personnel along with Federal, State, and local highway agency personnel.

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Pavements and Materials

Course Number: 131050A

Course Title: Asphalt Pavement Recycling Technologies

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course is the result of a joint effort between Federal Highway Administration (FHWA), the Asphalt Recycling and Reclamation Association (ARRA) and the National Center for Asphalt Technology (NCAT). The course provides in-depth technical content of several recycling methods. It also offers training related to performance of recycled mixes, legislation/specification limits, selection of pavement for recycling and recycling strategies, economics of recycling, and structural design of recycled pavements. The ARRA publication "Basic Asphalt Recycling Manual" is used as a reference in this course.

Outcomes: Upon completion of the course, participants will be able to:

- Describe the various methods (hot and cold) of recycling pavements.
- Determine when asphalt recycling is a viable pavement rehabilitation alternative.
- Select the most appropriate asphalt recycling method or technique.
- Identify materials and mix design for recycled pavements.
- Specify equipment, construction methods, and QC/QA involved in recycling.
- Demonstrate design methods for hot and cold recycled pavements.

Target Audience:

This course is intended for State and local highway officials, administrators, pavements design engineers and technicians, and construction engineers and inspectors involved in the recycling of asphalt pavements.

Technical Information	Matthew Corrigan	(202) 366-1549 matthew.corrigan@fhwa.dot.gov
	Jason Harrington	(202) 366-1576 jason.harrington@fhwa.dot.gov
NHI Training Program Manager	John Taylor	(703) 235-0524 john.taylor@fhwa.dot.gov

Pavements and Materials

Course Number: 131054A

Course Title: Pavement Preservation: The Preventive Maintenance Concept

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This training course provides an introduction to the concept of pavement preventive maintenance, including a description of currently available tools and technology that make the implementation of a pavement preventive maintenance program feasible. Targeting an audience of upper management and policy makers in highway agencies, the course focuses on the information needed to develop or improve a preventive maintenance program and illustrates the steps that five States have taken in the development of their own preventive maintenance programs. Considerably less emphasis is given to actual pavement preventive maintenance techniques themselves, although an extensive listing of pertinent references is provided for each technique. This is the first in a series of four courses on the general subject of pavement preservation. The second is NHI Course No. 131058 - Pavement Preservation: Selecting Pavements for Preventive Maintenance. The third and fourth courses are NHI Course No. 131103 - Pavement Preservation: Design and Construction of Quality Preventive Maintenance Treatments and NHI Course No. 131104 - Pavement Preservation: Integrating Pavement Preservation Practices and Pavement Management.

Outcomes:

Upon completion of the course, participants will be able to:

- Identify the components of a Pavement Preventive Maintenance (PPM) program.
- Identify various pavement preservation techniques and materials and discuss the need for performance evaluation and pavement condition analysis.
- Discuss the effects of various treatments on pavement performance and pavement condition indices.
- Describe the importance of integrating pavement preservation into pavement management systems.
- Explain cost/benefit concepts.

Target Audience:

This course is intended for upper- and mid-level highway agency professionals who are responsible for pavement preservation and management.

Technical Information	Steve Mueller	(202) 366-1557 steve.mueller@fhwa.dot.gov
NHI Training Program Manager	John Taylor	(703) 235-0524 john.taylor@fhwa.dot.gov

Pavements and Materials

Course Number: 131058A

Course Title: Pavement Preservation: Selecting Pavements for Preventive Maintenance

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course focuses on selecting the right pavement for various preservation treatments by evaluating the merits of each treatment under various field conditions. This course illustrates in detail the pavement evaluation, project selection, and material considerations for the various preventive maintenance applications. This is the second in a series of four courses on the general subject of pavement preservation. The first course is NHI Course No. 131054 - Pavement Preservation: The Preventive Maintenance Concept. The third and fourth NHI courses are 131103 - Pavement Preservation: Design and Construction of Quality Preventive Maintenance Treatments and 131104 - Pavement Preservation: Integrating Pavement Preservation Practices and Pavement Management.

Outcomes:

Upon completion of the course, participants will be able to:

- Identify pavement conditions and other attributes that suggest whether preventive maintenance is appropriate.
- Identify feasible treatments for the selected pavement.
- Select the appropriate technique(s) and the appropriate timing for pavement preservation actions to extend the service life and retard the development of pavement distress.
- Select a treatment based on consideration of life-cycle cost, improved performance, anticipated benefits, and other factors.

Target Audience:

Field managers and practitioners for both the owner of the facilities and industry.

Technical Information	Steve Mueller	(202) 366-1557 steve.mueller@fhwa.dot.gov
NHI Training Program Manager	John Taylor	(703) 235-0524 john.taylor@fhwa.dot.gov

Pavements and Materials

Course Number: 131060A

Course Title: Concrete Pavement Design Details and Construction Practices

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course provides participants with current guidelines on design and construction details for concrete pavements. Topics include important concrete pavement design details, including subgrade preparation, base selection, drainage design, thickness design, joint design and shoulder characterization. The course explains how to select the proper details to enhance structural performance. Emphasis is given to jointed plain concrete pavements (JPCP), although the course includes instruction on jointed reinforced concrete pavements (JRCP) and continuously reinforced concrete pavements (CRCP).

Outcomes:

Upon completion of the course, participants will be able to:

- Recognize the effect of critical concrete pavement design details on overall concrete pavement performance.
- Identify critical construction and maintenance practices that impact performance.
- Select appropriate concrete pavement design details to enhance the performance of the pavement for a specific design condition.

Target Audience:

This course is intended for highway engineers who are responsible for the design and construction of better-performing, longer-lasting concrete pavements.

Technical Information	Mark Swanlund	(202) 366-1323 mark.swanlund@fhwa.dot.gov
NHI Training Program Manager	John Taylor	(703) 235-0524 john.taylor@fhwa.dot.gov

Pavements and Materials

Course Number: 131062A

Course Title: Portland Cement Concrete Pavement Evaluation and Rehabilitation

Fee: \$335 Per Participant **Length:** 2.5 Days (CEU: 1.5 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course will present state-of-the-practice and state-of-the-art techniques to identify the causes and patterns of different types of pavement distress, and what techniques for rehabilitation selection, design, and construction can be applied for the various types of distress.

Outcomes:

Upon completion of the course, participants will be able to:

- Describe the typical behavior and performance of Portland Cement Concrete (PCC) pavements.
- Identify common PCC pavement distress types and be able to describe their mechanisms.
- Describe key components of a thorough project-level evaluation.
- Describe the variety of rehabilitation techniques available for PCC pavements.
- Identify feasible rehabilitation techniques for existing PCC pavements.
- Describe a process for selecting the preferred rehabilitation alternative for a given pavement.

Target Audience:

This course is intended for FHWA, State, and local highway engineers in design, construction, and maintenance who are involved in the application of pavement rehabilitation techniques.

Technical Information	Mark Swanlund	(202) 366-1323 mark.swanlund@fhwa.dot.gov
NHI Training Program Manager	John Taylor	(703) 235-0524 john.taylor@fhwa.dot.gov

Course Number: 131063A

Course Title: Hot-Mix Asphalt Pavement Evaluation and Rehabilitation

Fee: \$335 Per Participant **Length:** 2.5 Days (CEU: 1.5 Units) **Class Size:** Minimum 20; Maximum 30

Description:

The course presents state-of-the-practice and state-of-the-art techniques to identify the causes and patterns of different types of pavement distress, and what techniques for rehabilitation selection, design, and construction can be applied for the various types of distress.

Outcomes:

Upon completion of the course, participants will be able to:

- Describe typical behavior and performance of Hot-Mix Asphalt (HMA) pavements.
- Identify common types of HMA pavements distress and be able to describe their mechanisms.
- Describe key components of a thorough project-level evaluation.
- Describe the variety of rehabilitation techniques available and state what deficiencies they have.
- Identify feasible rehabilitation techniques for HMA pavements exhibiting different distresses and conditions.
- Develop the process for selecting the preferred rehabilitation alternative.

Target Audience:

This course is intended for FHWA, State, and local highway engineers in design, construction, and maintenance who are involved in the application of pavement rehabilitation techniques.

Technical Information	Jason Harrington	(202) 366-1576 jason.harrington@fhwa.dot.gov
NHI Training Program Manager	John Taylor	(703) 235-0524 john.taylor@fhwa.dot.gov

Pavements and Materials

Course Number: 131064A

Course Title: Introduction to Mechanistic Design for New and Rehabilitated Pavements

Fee: \$530 Per Participant **Length:** 4 Days (CEU: 2.4 Units) **Class Size:** Minimum 20; Maximum 30

The sponsoring agency must provide 15 computers with the following minimum requirements: Intel Pentium Processor, 8 MB RAM, 50 MB hard disk space, CD-ROM drive, Windows 95/NT 4.0 (or later version), VGA graphics card, and Microsoft Excel 5.0 (or later version). Some of the requirements are flexible and are a function of the software typically used in the class. Additional details can be obtained from NHI.

Description:

This course presents the theory and application of the most comprehensive, up-to-date mechanistic design concepts. The general framework of the mechanistic-empirical (M-E) design procedure and the individual components are discussed in detail. The course includes several hands-on workshops pertaining to materials characterization, structural response calculations, pavement performance prediction, and mechanistic-empirical pavement design. These workshops use real-world problems and exercises that enhance future application of this design methodology. Some of the workshops involve computations using public-domain pavement software and simple spreadsheet-based programs, and all are customized to each course based on project data provided by the host agency. The course also discusses ongoing research and the effects that current research activities might have on the state of the practice. Throughout the class, particular emphasis is placed on the mechanistic-empirical design concepts used in the 2002 Design Guide (NCHRP Project 1-37A) and those that form the foundation of the Superpave pavement performance prediction models. The course will include detailed discussions about the data needs (materials, traffic, environment, etc.) for local/regional calibration of the 2002 Design Guide and what steps agencies should take before the Guide is adopted and used on a day-to-day basis for design.

Outcomes:

Upon completion of the course, participants will be able to:

- List advantages of using M-E design.
- Calculate structural responses for flexible, rigid, and overlaid pavements.
- List major inputs to a mechanistic design procedure and how to obtain them.
- Explain sensitivity of layer thickness, material properties, joint spacing, etc. to structural responses.
- Back calculate layer moduli for flexible pavements.
- Explain how layer thickness, material properties, joint spacing, etc. affect pavement distresses.
- Construct a flowchart/outline for M-E design of flexible, rigid, and overlaid pavements.

Target Audience:

This course is intended for pavement design engineers, materials engineers, and pavement management practitioners from government transportation agencies, the paving industry, and design consultants.

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	Leslie Myers	(202) 366-1198 leslie.myers@fhwa.dot.gov
NHI Training Program Manager	John Taylor	(703) 235-0524 john.taylor@fhwa.dot.gov

Pavements and Materials

Course Number: 131100A

Course Title: Pavement Smoothness: Use of Inertial Profiler Measurements for Construction Quality Control

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course presents a comprehensive overview of pavement smoothness and is designed for those people who are directly involved in the use of inertial profilers and the application of the data obtained from inertial profilers. Participants will gain an understanding of the different types of measurement techniques and indices used for reporting smoothness from profilers. The course is divided into units that introduce participants to the various components of roadway profiling, the operational requirements of most inertial profiling devices, and the analysis of data from most types of inertial profilers.

Outcomes:

Upon completion of the course, participants will be able to:

- Describe the data collection process and operation of the inertial profilers as pavement profile measurement devices.
- Identify the basic elements of the inertial profiler, which include the profiler's components, how the equipment works, what raw data is being collected, outputs from the data collection process, and the filtering of the raw data itself.
- Explain how the inertial profiler output is used to establish various smoothness indices, including data processing techniques and computational procedures of different smoothness, or ride quality indices, identification of outliers, and factors that have an effect on the variability of the measurements.
- Explain the relationships between profiler results and the equipment used, the measurement surface conditions, the measurement environment, the profiler operation, and the profiler operators themselves.
- Explain how data acquisition and computational methods can affect computed indices, including the filtering process, sample intervals, record intervals, variability in collecting the data, and what factors have an effect on that variability.

Target Audience:

This course is intended for an audience directly involved in the use of inertial profilers and in the application of the data obtained from inertial profilers. This primarily includes road profiler operators and individuals responsible for data interpretation. Information may also be of interest to users of profiler output, engineers, and administrators.

Technical Information	Mark Swanlund	(202) 366-1323 mark.swanlund@fhwa.dot.gov
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Pavements and Materials

Course Number: 131103A

Course Title: Pavement Preservation: Design and Construction of Quality Preventive Maintenance Treatments

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 30

Description:

In preventive maintenance, the types of treatments and the timing of their applications provide highway agencies with a very broad range of life-extending treatment techniques, and enable agencies to achieve their goals of enhancing pavement performance in a cost-effective and efficient manner, while meeting their customers' needs for improved level of service. Obtaining optimal value from preventive maintenance treatments is only possible when preventive maintenance activities are fully linked to a pavement management system. There are many opportunities for such integration, from identifying and tracking the benefits of different treatments and timings to developing models that incorporate the effects of preventive maintenance. By using pavement management data for network level analysis, an effective pavement strategy can be developed that utilizes reconstruction, rehabilitation, and preventive maintenance actions. When used at the project level, pavement management can assist the decision-maker in selecting the best pavement preservation option to be designed and applied.

This course targets those field personnel involved in constructing preventive maintenance treatments, including both the buying agency's inspectors and the contractors' foremen and field crews. It contains modules on all of the categories of preventive maintenance treatments in widespread use today, focusing on the best practices for designing and constructing those treatments. It also addresses troubleshooting construction practices, so that participants can clearly identify the results of poor construction practices. This is the third in a series of four courses on the general subject of pavement preservation. The first and second NHI courses are available for scheduling: NHI Course No. 131054 - Pavement Preservation: The Preventive Maintenance Concept and NHI Course No. 131058 - Pavement Preservation: Selecting Pavements for Preventive Maintenance. The fourth course under development is NHI Course No. 131104 - Pavement Preservation: Integrating Pavement Preservation Practices and Pavement Management.

Outcomes:

Upon completion of the course, participants will be able to:

- Describe the benefits provided by preventive maintenance treatments.
- Describe critical design factors for preventive maintenance techniques.
- Describe the recommended procedures for the construction of the preventive maintenance techniques.
- Identify critical inspection objectives.

Target Audience:

Construction foremen and agency construction inspectors, up to and including middle managers. While it is aimed at those who have some familiarity with the equipment and materials used to construct effective preventive maintenance treatments, the course should also be of value to those just starting out in the maintenance field.

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NHI Training Program Manager	John Taylor	(703) 235-0524 john.taylor@fhwa.dot.gov

Pavements and Materials

Course Number: 131104A

Course Title: **Pavement Preservation: Integrating Pavement Preservation Practices and Pavement Management**

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This is the fourth in a series of four courses on the general subject of pavement preservation. The first and second NHI courses are available for scheduling: 131054 - Pavement Preservation: The Preventive Maintenance Concept and 131058 - Pavement Preservation: Selecting Pavements for Preventive Maintenance. The third NHI course is NHI Course No. 131103 - Pavement Preservation: Design and Construction of Quality Preventive Maintenance Treatments.

Outcomes:

Upon completion of the course, participants will be able to:

- Name several ways pavement management tools can support a pavement preservation program the project, network, and strategic analysis levels.
- List the reasons it is important for an agency to integrate pavement preservation into its management activities.
- Name the ways that pavement preservation techniques can be integrated into pavement management models.
- Name some of the common obstacles to the successful integration of pavement preservation and pavement management programs and strategies for overcoming these obstacles.

Target Audience:

This course is primarily intended for pavement management engineers, district (or regional) maintenance engineers, local agency engineers, maintenance management engineers, and planning and programming personnel.

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Pavements and Materials

Course Number: 131105A

Course Title: Analysis of PMS Data for Engineering Applications

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course is a compilation of case studies from States that are using the years of condition data stored in their Pavement Management System (PMS) to:

- Track the real life performance of pavements,
- Evaluate and analyze pavement overlay design,
- Track performance of materials and construction,
- Incorporate preventive maintenance actions, and
- Evaluate maintenance or pavement performance.

Outcomes:

Upon completion of the course, participants will be able to:

- Analyze their agencies' need to either add additional data to their PMS or electronically link databases so that engineering analysis can be done.
- Describe the range of applications and the processes needed to do engineering analysis.

Target Audience:

The course is intended for design engineers, materials engineers, maintenance engineers, QA/QC staff and pavement management staff.

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Pavements and Materials

Course Number: 131106A

Course Title: Transportation Asset Management

Fee: \$200 Per Participant **Length:** 1 Day (CEU: 0.6 Unit) **Class Size:** Minimum 20; Maximum 40

Description:

Asset Management is a systematic process of maintaining, upgrading, and operating physical assets cost effectively. It combines engineering principles with sound business practices and economic theory, and it provides tools to facilitate a more organized, logical approach to decision-making. In the broadest sense, Transportation Asset Management is a strategic approach to managing physical transportation infrastructure. This is an introductory course that covers the principles, concepts, components, techniques, and benefits of Asset Management. The material in this course is based on AASHTO's "Transportation Asset Management Guide" that was produced under National Cooperative Highway Research Program (NCHRP) Project 20-24(11). The intent of the course is to support, complement, and build familiarity with using the Guide. The course illustrates asset management "best practices" in key functions of a transportation agency's resource allocation and utilization, policy development, planning and programming, program delivery, operations, and use of information and analytic tools. It also provides a self-assessment process that can be applied within transportation agencies to benchmark current asset management practices and identify potential areas for further enhancement and implementation. The course includes exercises to help participants deal with realistic situations in the context of good asset management practice.

Outcomes:

Upon completion of the course, participants will be able to:

- Understand the fundamentals of Transportation Asset Management.
- Appreciate why using Transportation Asset Management is important to their agencies.
- Begin to visualize how the framework and principles of Transportation Asset Management relate and fit into their agencies' business processes.
- Use the Self-Assessment Guide to assess and benchmark their agencies Transportation Asset Management program.
- Begin to develop Transportation Asset Management goals and objectives for their agencies.

Target Audience:

The course is intended for senior-level and mid-level managers from State departments of transportation and other transportation agencies. A 35-minute module at the beginning of the course provides a succinct overview of asset management that is suitable for executives. Inasmuch as Transportation Asset Management crosscuts an organization's functions, participants should represent a number of organizational units, including (but not limited to) planning, engineering (e.g., facility management, design, construction), capital programming, maintenance and operations, financial management, traffic and safety engineering, system operation and management, and information technology. These individuals will typically have the responsibility for decision-making in one or more areas addressed by Transportation Asset Management. The course is also intended for individuals who directly support decisions, business processes, or results related to Transportation Asset Management, e.g., by managing and providing critical information to senior managers, or by having direct responsibility for meeting specific transportation system performance or program delivery targets.

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NHI Training Program Manager	John Taylor	(703) 235-0524 john.taylor@fhwa.dot.gov

Course Number: 132012A

Course Title: Soils and Foundations Workshop

Fee: \$530 Per Participant **Length:** 4 Days (CEU: 2.4 Units) **Class Size:** Minimum 20; Maximum 30

The sponsoring organization is responsible for providing access to a materials laboratory for demonstration purposes. Course runs from 1:00 PM on Monday through noon on Friday.

Description:

This course is geared toward the practicing design and construction engineers in the foundation field, routinely dealing with soil and foundation problems, who have little theoretical background in soil mechanics or foundation engineering. The course takes a project-oriented approach whereby the soils input to a fictitious bridge project is followed from conception to completion. A visit to a laboratory is used to illustrate basic soil concepts in typical major project phases. In each phase of the fictitious project, the soil concepts will be developed into specific foundation designs and recommendations. Classroom presentation includes a variety of exercises to verify achievement of learning objectives. Each participant will take away a notebook containing a complete foundation design, completed exercises, and enough reference data to independently complete other related activities.

Outcomes:

Upon completion of the course, participants will be able to:

- Develop a visual description of soils native to the host state.
- List the basic soil test procedures and application of soil test results to highway projects.
- Demonstrate basic procedures used for both settlement and stability analysis, and identify design solutions to stability and settlement problems.
- Demonstrate procedures used for determining bearing capacity and settlement of spread footing foundations.
- Demonstrate basic skill in the design and construction management of driven pile foundations.
- Identify driven pile foundation construction equipment and procedures for construction.
- Identify format and provide minimum content for an adequate foundation report.

Target Audience:

Geotechnical specialists, bridge designers, highway designers, construction engineers, maintenance engineers and drillers and especially the first-line supervisors involved in the design of highway structures and earthworks. The greatest impact will be achieved by convincing structural, design, and construction engineers to use procedures from this course as a guide for routine geotechnical work. One of the major benefits is to give engineers an appreciation of activities outside their specialties that influence, or are influenced by, the work of the geotechnical specialist. All attendees should be encouraged to attend the entire course. The one exception is for drillers who could be invited to attend only the first phase of the course.

Technical Information	Ben Rivers	(404) 562-3926 benjamin.rivers@fhwa.dot.gov
NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Geotechnical

Course Number: 132013A

Course Title: Geosynthetics Engineering Workshop

Fee: \$200 Per Participant **Length:** 1 Day (CEU: 0.6 Unit)

\$400 Per Participant

3 Days (CEU: 1.8 Units) Class Size: Minimum 20; Maximum 30

Description:

Two courses are available. These courses provide training on the correct, cost-effective utilization of geosynthetics in transportation applications. The use of geotextiles, geogrids, pavement edge drains, drainage composites, erosion control materials, sediment control materials, and geomembranes are examined. Applications of filtration, drainage, temporary and permanent erosion control, sediment control, roadway separation, roadway reinforcement, roadway subgrade improvement, pavement overlays, embankments over soft foundations, mechanically stabilized earth walls, mechanically stabilized earth slopes, geomembrane containment ponds, and geomembrane pavement.

The 1-day Summary course provides an introduction to geosynthetics, focusing on identifying, specifying, testing, installing, and inspecting geosynthetic installations.

The 3-day Design and Construction course provides a review of design procedures, expands on the material of the 1-day Summary course and includes workshop problems and student exercises.

Outcomes:

Upon completion of the course, participants will be able to:

- Determine if geosynthetics are a feasible, cost-effective option for construction or maintenance of transportation earthworks.
- Specify procedures for and oversee geosynthetic installations.
- Locate references on geosynthetic materials and geosynthetic applications.
- Prepare conceptual and basic designs for filtration, drainage, temporary and permanent erosion control, sediment control, roadways, pavement overlays, embankments over soft foundations, mechanically stabilized earth walls and earth slopes, and geomembrane transportation applications. [3-day only]
- Select appropriate material property and design parameter test methods for specific geosynthetic projects, and differentiate between index and performance tests/properties. [3-day]
- Develop appropriate materials and construction specifications for geosynthetic projects. [3-day]
- Determine the need for site specific monitoring or special inspection schemes to ensure compliance with design. [3-day only]

Target Audience:

Federal, State and local transportation personnel (bridge, hydraulic, pavement, geotechnical, construction, and maintenance engineers, and construction inspectors and technicians): 1-day course for those involved with construction and maintenance of transportation facilities that include earthwork construction; 3-day course for those involved with design and/or construction of transportation facilities that incorporate earthwork. Public agency and private sector engineers and project inspectors responsible for installation, monitoring and inspection of geosynthetics installations can attend either course. There are no prerequisites, although prior attendance in NHI Course No. 132012 - Soils and Foundations Workshop is recommended.

Technical Information	Rich Barrows	(360) 619-7704 rich.barrows@fhwa.dot.gov
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NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Training Coordinator (703) 235-0528 Fax (703) 235-0593 Email NHITraining@fhwa.dot.gov
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Geotechnical

Course Number: 132014A

Course Title: Drilled Shafts

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 30

Description:

Drilled shafts are an alternate type of deep foundation that may be more cost-effective than, and have improved performance compared to, other types of deep foundations in bridge piers at river crossings, retrofit operations, high-mast lighting, earth retaining structures, single column piers and similar applications. This course provides participants with specific technical guidance on all aspects of designing, installing and monitoring of drilled shafts. The lessons address the following topics: applications, advantages and disadvantages of drilled shafts for transportation structure foundations; general requirements for subsurface investigations; construction methods; construction case histories; construction specifications; principles of design of drilled shafts for axial and lateral loading; expansive soils, downdrag and similar effects; load testing; inspection; integrity testing; repair and retrofit of defective shafts; and cost estimation. The participants will receive a comprehensive Reference Manual on drilled shaft construction and design used by engineers who perform detailed designs of drilled shafts, write construction specifications and evaluate the performance of the contractor through a comprehensive inspection program.

Outcomes:

Upon completion of the course, participants will be able to:

- Describe the various drilling rigs and tools that are available to construct drilled shafts under varied subsurface soil and rock conditions.
- Recognize the basic features of drilling aids such as casings and drilling slurries and the reasons for certain fundamental requirements for these aids.
- Design drilled shafts for axial loading in simple soil and rock profiles.
- Demonstrate a general understanding of the elements of designing drilled shafts for lateral loads.
- Demonstrate an understanding of the need for load tests and available methods for performing them.
- Formulate the basic elements of construction specifications for drilled shafts.
- Estimate costs for drilled shafts.

Target Audience:

Geotechnical engineers, bridge designers, and resident engineers. The course embraces both construction and design, and it is important that all participants attend all lessons, not just those in the immediate area of interest. A key issue is how the details of construction affect the way in which a drilled shaft should be designed and how the intent of the design affects inspection. Participants in the course are expected to have a degree in engineering for which they have passed an undergraduate course in soil mechanics and/or have successfully completed NHI Course No. 132012 - Soils and Foundations Workshop. This course is intended for field or laboratory personnel with a background in engineering.

Technical Information	Barry Siel	(303) 716-2191 barry.siel@fhwa.dot.gov
	Curtis Monk	(515) 233-7320 curtis.monk@fhwa.dot.gov
NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Geotechnical

Course Number: 132021A

Course Title: Driven Pile Foundations - Design and Construction

Fee: \$530 Per Participant **Length:** 4 Days (CEU: 2.4 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course covers the practical application of driven pile technology, with the emphasis on data interpretation and decision-making issues common to real life construction projects. The course addresses: subsurface investigation, pile selection, economic analysis, static design analysis (single pile and pile group behavior under compression, tension and lateral loading, pile settlement, negative skin friction) specifications and contracting documents, construction monitoring (pile inspection, dynamic driving formulas, wave equation analysis, dynamic testing), static methods of pile load testing, driven pile installation equipment and accessories. This course also covers: definition and design procedures of aggressive subsurface conditions; the driven computer program for calculation of static pile capacity; design procedures for downdrag, scour, squeeze, and heave; plugging of open pile sections; and group design for lateral and uplift loads. Instructional methods include workshops, student exercises and sample problems to transfer the necessary knowledge and skills to plan and design driven pile foundation projects, and to implement QA/QC procedures during construction.

Outcomes:

Upon completion of the course, participants will be able to:

- Implement a systematic plan for the design and construction of driven pile foundations.
- Choose the appropriate pile type in a given soil profile based on the advantages and disadvantages of common driven pile types.
- Calculate single and group capacities of driven piles to resist compression, tension, and lateral loads.
- Use time dependent soil strength changes in pile foundation design and construction control.
- Identify the project influence and significance of pile driveability, pile refusal, minimum and estimated pile toe elevations.
- Calculate allowable design and allowable driving stresses for common pile types.
- Identify pile hammer types, their operational characteristics, and key pile hammer and pile hammer accessory inspection issues.

Target Audience:

The course material has been developed for geotechnical specialists, bridge engineers, construction engineers, consultant review specialists and advanced level technicians. This course is suitable for entry level and experienced engineers and advanced level technicians. Attendees should have a basic knowledge of subsurface investigation methods and the general aspects of foundation design and construction.

Technical Information	Chris Dumas	(410) 962-0096 chris.dumas@fhwa.dot.gov
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Geotechnical

Course Number: 132022A

Course Title: Driven Pile Foundations - Construction Monitoring

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course provides information on current methods of driven pile technology with emphasis on data interpretation and decision-making issues common to driven pile installation and monitoring. The course covers the following areas: specifications, contracting issues, pile installation, monitoring and inspection. Application and interpretation of the wave equation, and dynamic and static pile load testing methods are highlighted, with an emphasis on the practical issues related to pile monitoring and acceptance on typical construction projects. Construction material includes: pile capacity verification by formula, wave equation, dynamic test or static test; performance and interpretation of compression, tension, and lateral load tests; new load testing devices, the Osterberg Cell and Statnamic; operation and inspection of pile hammers including new hydraulic hammers; and troubleshooting of pile hammer operation and pile installation problems. (Refer to NHI Course No. 132021A - Driven Pile Foundations - Design and Construction for additional background information.) The goal of this course is to transfer the necessary knowledge and skills needed to plan driven pile foundation projects, and to implement QA/QC procedures during construction.

Outcomes:

Upon completion of the course, participants will be able to:

- Implement a systematic plan for the construction of driven pile foundations.
- Discuss the appropriate pile type in a given soil profile based on the advantages and disadvantages of common driven pile types.
- Identify pile refusal, and minimum and estimated pile toe elevations.
- Define key components of driven pile specifications.
- Identify pile hammer types, their operational characteristics, and key pile hammer and pile hammer accessory inspection issues.
- Identify pile toe accessories, pile splicing methods, and pile installation aids applicable to the pile type and subsurface conditions.
- Explain appropriate methods of pile installation inspection.

Target Audience:

The course material has been developed for geotechnical specialists, bridge engineers, construction engineers, consultant review specialists and advanced level technicians involved in and responsible for the specification and construction monitoring of driven pile foundations. Basic knowledge of subsurface investigation methods is desirable.

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Geotechnical

Course Number: 132031A

Course Title: Subsurface Investigations

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course presents the latest methods and procedures in the planning, execution and interpretation of the various subsurface investigation methods and the development of appropriate soil and rock design and construction parameters for engineering applications. Topics include: the geotechnical specialist's role in subsurface investigations; exploration methodologies; exploratory equipment types and their suitability for various subsurface conditions; the use of in-situ testing and geophysical surveys for subsurface characterization; the handling, transportation and storage of soil and rock samples; and laboratory testing techniques and interpretation of data. Contracting for soil and rock investigations, correlation of soil and rock properties, and preparation of clear and concise geotechnical reports are also covered. Classroom instruction includes student exercises and example problems to reinforce course objectives.

Outcomes:

Upon completion of the course, participants will be able to:

- Recognize the importance of performing an adequate subsurface investigation.
- Plan and execute a subsurface exploration program for a typical surface transportation project.
- Use existing information in the planning of the investigation program.
- Apply appropriate in-situ testing procedures based upon the expected subsurface conditions and obtain high quality soil and rock samples for laboratory testing.
- Assign appropriate laboratory testing procedures for determining soil and rock design.
- Interpret the results of laboratory tests and determine soil and rock parameters to be used in design.
- Summarize results of subsurface investigation in a concise geotechnical investigation report.

Target Audience:

FHWA, State, and local transportation agency employees, college and university faculty, and consultant engineers who are or will be involved in the planning, execution, review and interpretation of subsurface investigations. An undergraduate degree in geology, engineering geology, civil engineering or equivalent engineering experience in the highway/transportation field is desirable.

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Geotechnical

Course Number: 132033A

Course Title: Soil Slope and Embankment Design and Construction

Fee: \$335 Per Participant **Length:** 2.5 Days (CEU: 1.5 Units) **Class Size:** Minimum 20; Maximum 30
The participants will receive a comprehensive Reference Manual on investigation, design, construction and mitigation of soil slopes and embankments used by practicing highway/geotechnical engineers. The Participant Workbook contains copies of visual aids and student exercises that closely follow the PowerPoint slide presentations. The student exercises promote interaction in the classroom and illustrate the basic principles and analyses.

Description:

This course covers important aspects associated with the design and construction of soil slopes and embankments. It is intended to provide transportation earthwork professionals with knowledge to recognize potential soil slope/embankment stability and deformation problems in transportation projects, and to develop necessary skills to design and evaluate soil slopes and embankments, and consider the construction and inspection implications. The course embraces both design and construction, and it is important for all participants to attend all lessons, not just those in their immediate area of interest.

Outcomes:

Upon completion of the course, participants will be able to:

- Recognize potential failure modes or deformation types for soil slopes and embankments.
- Identify the potential failure modes for soil slopes and the type of analysis required to evaluate stability of the slope.
- Determine the stability of a slope using slope stability charts.
- Recognize the major design consideration for embankments constructed using earth fill, rock fill, and lightweight fill.
- List the design steps necessary for the design of an embankment over compressible foundation soil.
- List the common causes/triggering mechanisms for landslides/slope instabilities.
- List appropriate stabilization methods.

Target Audience:

FHWA, State, and local highway agency employees, college and university faculty, and consultant engineers/geologists who are involved in the analysis, design, construction, maintenance, and remediation of soil slopes and embankments on surface transportation facilities. An undergraduate degree in civil engineering or equivalent engineering experience in the highway/transportation field.

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Geotechnical

Course Number: 132034A

Course Title: Ground Improvement Techniques

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 30
Technical content is based on updated and expanded scope from FHWA's Demonstration Project No.116.

Description:

This course covers important design and construction aspects associated with ground improvement techniques. Topics on ground improvement techniques include: grouting, vertical drains, stone columns, lightweight fill, vibro compaction, dynamic compaction, deep soil mixing, column supported embankments and other new and innovative concepts. The goal of this course is to have each participant recognize the applicability of, and develop preliminary cost analysis for, specific ground improvement method(s) that could be employed to sufficiently improve the ground, soil and rock, to permit construction of earthwork, bridge and earth retaining structure transportation features. Participants completing this course will develop an appreciation for the necessary subsurface exploration and laboratory characterization necessary for subsurface soil and rock as well as the requisite design parameters necessary to develop a preliminary design and cost estimate. The course is designed so that maximum input will be elicited from the students, particularly regarding an understanding of application criteria, the impact of geotechnical features on the long-term performance and contracting methods.

Outcomes:

Upon completion of the course, participants will be able to:

- Locate criteria to determine the applicability of each ground improvement method for a specific project under consideration.
- Describe advantages, disadvantages and limitations for each ground improvement method discussed.
- Locate and identify required soil and rock properties necessary to perform preliminary design.
- Prepare conceptual and basic designs, and be able to check contractor submitted designs.
- Discuss appropriate QA/QC methods for each type of ground improvement method.
- Summarize key elements of a preferred contracting method for each technique.
- Develop a preliminary cost estimate based on a preliminary design.

Target Audience:

FHWA, State, and local highway agency employees, college and university faculty, and consultant engineers who are or will be involved in the geotechnical aspects of the design and construction of transportation facilities through problem soils. An undergraduate degree in geology, engineering geology, civil engineering or equivalent engineering experience in the highway/transportation field is desirable.

Technical Information	Silas Nichols	(410) 962-2460 silas.nichols@fhwa.dot.gov
NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Geotechnical

Course Number: 132035A

Course Title: Rock Slopes

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30
The participants will receive a comprehensive Reference Manual (FHWA-HI-99-007) and the accompanying Student Exercise (FHWA-HI-99-036). The Reference Manual is a comprehensive reference on investigation, design, and construction of rock slopes for highway/geotechnical engineers, and is geared to the practicing engineer who is involved with rock slope design and stabilization, but may not have the complete theoretical background. The Student Exercises (FHWA HI-99-036) are designed to promote interaction in the classroom, and to illustrate the basic principles and analyses. Solutions to the exercises are included with each exercise.

Description:

The course presents appropriate geological investigation techniques, shear strength theories and determination of rock strength, and various design methods for rock slopes with different failure mechanisms. Other topics include: rock blasting, rock slope stabilization methods and contracting issues. Classroom instruction includes the discussion of sample problems and case histories involving rock slope analyses and design.

Outcomes:

Upon completion of the course, participants will be able to:

- Describe the basic principles of rock slope design.
- Plan and execute a geological investigation including geologic mapping.
- Perform appropriate in-situ and laboratory strength tests.
- Determine rational design rock strength parameters by proper evaluation of in-situ and laboratory test data along with appropriate rock strength correlations.
- Identify the failure mechanisms associated with rock slopes and apply appropriate design methodologies.
- Design effective rock-fall protection and slope stabilization measures.
- Design a monitoring program for cut slopes.

Target Audience:

FHWA, State, and local highway agency employees, college and university faculty, and consultant engineers/geologists who are or will be involved in the design, excavation and stabilization of rock slopes. An undergraduate degree in geology, engineering geology, civil engineering, or equivalent engineering experience in the highway/transportation field is desirable.

Technical Information	Barry Siel	(303) 716-2191 barry.siel@fhwa.dot.gov
NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Geotechnical

Course Number: 132036A

Course Title: Earth Retaining Structures

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course addresses the selection, design, construction and performance of earth retaining structures used for support of fills or excavations and cut slopes. Factors that affect wall selection are discussed, including contracting approaches with an emphasis on required bidding documents for each approach. Class discussions will include design procedures and case histories, demonstrating the selection, design and performance of various earth retaining structures.

Outcomes:

Upon completion of the course, participants will be able to:

- Recognize potential applications for retention structures used in transportation facilities.
- Select the most technically appropriate and cost-effective type of retaining wall for the application from a thorough knowledge of available systems.
- Examine and select appropriate material properties, soil design parameters and earth pressure diagrams.
- Prepare conceptual and basic (e.g., for simple geometry) designs, using appropriate design methods, factors of safety, earth pressure diagrams and field verification methods and be able to appraise contractor submitted designs.
- Select appropriate specification/contracting method(s) and prepare contract documents.
- Demonstrate a clear understanding of retaining wall construction and maintenance.

Target Audience:

FHWA, State, and local highway agency employees, college and university faculty, and consultant engineers/geologists who are or will be involved in the design, excavation and stabilization of rock slopes. An undergraduate degree in geology, engineering geology, civil engineering, or equivalent engineering experience in the highway/transportation field is desirable.

Technical Information	Barry Siel	(303) 716-2191 barry.siel@fhwa.dot.gov
NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Geotechnical

Course Number: 132037A

Course Title: Shallow Foundations

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30
The participants will receive a comprehensive Reference Manual on investigation, design, and construction of shallow foundations used by highway/geotechnical engineers that will be referred to during the course so the participants will become familiar with its contents. The student exercises book is an interactive teaching tool for the course.

Description:

This course provides transportation earthwork professionals with the necessary skills to design shallow foundations for transportation applications, and consider the construction and inspection implications on the design. The course will be of most benefit to geotechnical engineers, engineering geologists, foundation designers, project engineers, and highway/bridge engineers who are involved in design and construction of foundations for surface transportation projects. Presentation of the course is in an interactive format so that the participants are actively involved in the learning experience.

Outcomes:

Upon completion of the course, participants will be able to:

- Recognize potential failure modes or deformation types for soil slopes and embankments.
- Develop the ability to judge when shallow foundations should be considered.
- List the failure modes of shallow foundations.
- Determine the bearing capacity of shallow foundations on soils and rocks.
- Calculate vertical stress distribution below a shallow foundation.
- Determine the primary consolidation settlement of shallow foundations on cohesive soils.
- Determine the settlement of shallow foundations on cohesionless soils.
- Identify problematic soils that may be encountered.
- List the soil improvement techniques that may be used to improve the performance of shallow foundations.
- List ground improvement techniques that may be used to improve the performance of shallow foundations.
- Describe procedures for construction inspection and performance monitoring of shallow foundations.

Target Audience:

FHWA, State, and local highway agency employees, college and university faculty, and consultant engineers/geologists who are involved in the analysis, design, construction, maintenance, and remediation of soil slopes and embankments on surface transportation facilities. An undergraduate degree in civil engineering or equivalent engineering experience in the highway/transportation field is desirable.

Technical Information	Jerry DiMaggio	(202) 366-1569 jerry.dimaggio@fhwa.dot.gov
NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Geotechnical

Course Number: 132040A

Course Title: Geotechnical Aspects of Pavements

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course covers the latest methods and procedures to address the geotechnical issues in pavement design, construction and performance for new construction, reconstruction, and rehabilitation (e.g., road widening) pavement projects. The course content includes: geotechnical exploration and characterization of in place and constructed subgrades; designing and constructing pavement subgrades and unbound materials for paved and unpaved roads with emphasis on the mechanistic-empirical design approach, including the three levels of design inputs; the overall geotechnical and drainage aspects of bases, subbases and subgrades (for a safe, cost-effective and durable pavement); and construction and inspection of pavement projects.

The goal of this course is to have each participant recognize the essential importance of the geotechnical aspects relevant to the design, construction and performance of a pavement system. Participants completing this course will develop an appreciation for adequate subsurface exploration and laboratory characterization of subgrade soils as well as the requisite design parameters for unbound base layers and drainage features in relation to pavement design. The course is designed so that maximum input will be elicited from the students, particularly regarding an understanding of the impact of geotechnical features on the long-term performance of pavement systems.

Outcomes:

Upon completion of the course, participants will be able to:

- Explain the geotechnical parameters of interest in pavement design and their effect on the performance of different types of pavements.
- Explain the influence of climate, moisture, and drainage on pavement performance.
- Identify and explain the impact of unsuitable subgrades on pavement performance.
- Determine the geotechnical inputs needed for design of pavements.
- Evaluate and select appropriate remediation measures for pavement subgrades.
- Explain the geotechnical aspects of construction specifications and inspection requirements.
- Identify subgrade problems during construction and develop recommended solutions.

Target Audience:

Primary audience is agency and consultant bridge/structures, geotechnical, and roadway design engineers; engineering geologists; and consultant review specialists. Additionally, management, specification and contracting specialists, and construction engineers interested in design and contracting aspects of MSEW and RSS structures are encouraged to attend. Attendees should have a basic knowledge of soil mechanics and structural engineering. (Note that NHI offers a 1-day MSEW and RSS Construction course (No. 132043), and the target audience for that course is construction engineers, inspectors, and technicians.)

Technical Information	Sam Mansukhani	(708) 283-3550 sam.mansukhani@fhwa.dot.gov
NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Geotechnical

Course Number: 132041A

Course Title: Geotechnical Instrumentation

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

Description:

The course is designed to provide the student with the necessary knowledge and skills to plan, select, and implement instrumentation programs in geotechnical features for construction monitoring and performance verification. The course will cover measurement tools, including recommendations for a systematic and complete approach to planning monitoring programs. Recommendations for the selection of proper instrumentation for various types of construction are presented. Field tasks covered include: calibration, maintenance and installation of instrumentation, collection of instrumentation data, processing and presentation of collected data, interpretation of processed data and reporting of results.

Outcomes:

Upon completion of the course, participants will be able to:

- Recognize effective uses of geotechnical instrumentation in transportation projects.
- Identify benefits of instrumentation to help participants promote instrumentation programs to their teams (ultimate benefit - save money).
- Recognize the need to follow a systematic approach when planning, selecting, and executing an instrumentation program and identify the components of a systematic approach.
- Identify available instrumentation and how it is used for answering key geotechnical questions.
- Identify where to find additional information and assistance.
- Perform an evaluation of the need for and potential benefits of geotechnical instrumentation on a project.

Target Audience:

FHWA, State, and local highway agency employees, college and university faculty, and consultant engineers/geologists who are or will be involved in the design, evaluation and construction of pavements. An undergraduate degree in civil engineering, geology or equivalent engineering experience in the highway/transportation field is desirable.

Technical Information	Silas Nichols	(410) 962-2460 silas.nichols@fhwa.dot.gov
NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Geotechnical

Course Number: 132042A

Course Title: Design of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 30

Description:

Mechanically Stabilized Earth Walls (MSEW) and Reinforced Soil Slopes (RSS) are two modern methods of earth fill construction that are extremely cost effective and aesthetically pleasing. The basic concept behind these related methods is to combine soil, reinforcing materials made of steel or polymers and appropriate facing to produce a composite material with improved engineering properties. Both MSEW and RSS provide substantial construction time and cost savings when compared with other conventional types of earth-retaining systems.

The goal of this course is to provide agencies with state-of-the-practice design tools and construction practices to initiate or continue implementation of mechanically stabilized earth technology for routine use of cost-effective earth retention structures. This course would be of most benefit to persons who are involved in design and construction of earth retention structures for surface transportation.

Outcomes:

Upon completion of the course, participants will be able to:

- Recognize potential applications for MSEWs and RSS structures for use in transportation facilities.
- Prepare conceptual and basic (e.g., for simple geometry) designs, and be able to check contractor submitted designs for walls and slopes.
- Examine and select appropriate material properties and parameters used in design.
- Calculate cost of conceptual MSEWs and RSS structures, and determine if construction is a cost-effective option.
- Select appropriate specification/contracting method(s). Prepare detailed materials and methods of construction specifications.
- Define and communicate major components of construction inspection of MSEWs and RSS structures, to confirm compliance with design.

Target Audience:

Primary audience is agency and consultant bridge/structures, geotechnical, and roadway design engineers; engineering geologists; and consultant review specialists. Additionally, management, specification and contracting specialists, and construction engineers interested in design and contracting aspects of MSEW and RSS structures are encouraged to attend. Attendees should have a basic knowledge of soil mechanics and structural engineering. (Note that NHI offers a 1-day MSEW and RSS Construction course (No. 132043), and the target audience for that course is construction engineers, inspectors, and technicians.)

Technical Information	Rich Barrows	(360) 619-7704 rich.barrows@fhwa.dot.gov
NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Course Number: 132043A

Course Title: Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes

Fee: \$200 Per Participant **Length:** 1 Day (CEU: 0.6 Unit) **Class Size:** Minimum 20; Maximum 30

Description:

Mechanically Stabilized Earth Walls (MSEW) and Reinforced Soil Slopes (RSS) are two modern methods of earth fill construction which are extremely cost effective and aesthetically pleasing. The basic concept behind these related methods is to combine soil, reinforcing materials made of steel or polymers and appropriate facing to produce a composite material with improved engineering properties. Both MSEW and RSS provide substantial construction time and cost savings when compared with other conventional types of earth retaining systems.

The goal of this course is to provide agencies with current construction practices for continued, or to initiate, implementation of mechanically stabilized earth technology for routine use of cost effective earth retention structures. This course is most beneficial to persons who are involved in construction of earth retention structures for surface transportation projects.

Outcomes:

Upon completion of the course, participants will be able to:

- Recognize potential applications for MSEWs and RSS structures for use in transportation facilities.
- Recognize differences between available systems and their components.
- Understand the intent of specification/contracting method(s).
- Define and communicate major components of construction inspection of MSEW and RSS structures, to confirm compliance with design.

Target Audience:

Primary audience is agency and consultant construction engineers, inspectors and technicians. Additionally, management, specification and contracting specialists, bridge/structures, geotechnical, and roadway design engineers, and engineering geologists interested in construction aspects of MSEW and RSS structures are encouraged to attend. Attendees should have a basic knowledge of soil mechanics and structural engineering. (Note that NHI offers a 3-day Design of MSEW and RSS Structures course (No. 132042), and the target audience of that course is bridge/structures, geotechnical, and roadway design engineers, and engineering geologists.)

Technical Information	Rich Barrows	(360) 619-7704 rich.barrows@fhwa.dot.gov
NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Geotechnical

Course Number: 132069A

Course Title: Driven Pile Foundation Inspection

Fee: \$335 Per Participant **Length:** 2.5 Days (CEU: 1.5 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course was developed to provide a basis for local, regional or national qualification for pile driving inspectors of all States. Its goal is to provide inspectors with the practical knowledge and accepted standard industry practices for the inspection of pile driving construction operations. To establish a national standard for transportation personnel, this course was developed based upon the existing Florida DOT's Pile Driving Inspector's Qualification course materials, the 2000 AASHTO Bridge Construction Specifications, and FHWA/NHI courses 132021 "Driven Pile Foundations - Design and Construction," and 132022 "Driven Pile Foundations - Construction Monitoring." However, the local specifications, inspection reports, and plan sheets available from the hosting agency also will be discussed. The course includes a 3-hour qualification examination.

Outcomes:

Upon completion of the course, participants will be able to:

- Explain the inspector's role, duties and responsibilities.
- Describe the pile driving system components.
- Recognize key inspection elements of the contract documents.
- Identify proper communication and coordination with the engineer and contractor.
- Identify the key elements of a pile installation plan.
- Recognize and identify pile driving system components and tools.
- Verify tip elevations, cutoff elevations, pile penetration and length driven for vertical and battered piles.
- Perform inspection of pile driving operations and verify compliance to construction tolerances.
- Recognize "when to stop driving" based upon provided driving criteria, minimum tip or penetration and refusal guidelines.
- Verify pile condition, labeling and marking for compliance.
- Recognize and explain the difference between test piles and production piles and the various types of pile testing.
- Identify "driving" irregularities.
- Identify and document pay quantities.
- Interpret and apply applicable AASHTO specifications relating to foundation acceptance.
- List potential problems and safety issues.

Target Audience:

Foundation or major structures inspectors involved in inspection of pile driving operations during construction. Additionally, project management and construction engineers in charge of pile driving construction inspection are encouraged to attend. Attendees should have completed courses in basic construction plan reading, basic construction math and high school algebra.

Technical Information	Peter Osborn	(401) 528-4550 peter.osborn@fhwa.dot.gov
NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Geotechnical

Course Number: 132070A

Course Title: Drilled Shaft Foundation Inspection

Fee: \$335 Per Participant **Length:** 2.5 Days (CEU: 1.5 Units) **Class Size:** Minimum 20; Maximum 30

Description:

The Drilled Shaft Foundation Inspection course is a stand-alone training course developed to provide a basis for local, regional, or national qualification of drilled shaft foundation inspectors. The goal of this course is to provide drilled shaft foundation inspectors with practical knowledge and standard industry practices for the inspection of drilled shaft foundation construction. This course is designed to be of most benefit to foundation inspectors, who are responsible for or involved in providing inspection of drilled shafts during construction. Presentation of the course is in an interactive format so that the participants are actively involved in the learning experience. A two-hour qualification exam is administered on the third day of the course. The course follows recommended FHWA specifications and practices for drilled shaft construction, but this may be modified to follow local agency specifications and practices, which may deviate from recommended FHWA specifications and practices.

Outcomes:

Upon completion of the course, participants will be able to:

- Identify and understand the role and duties of the inspector.
- Recognize key inspection elements of the contract documents.
- Identify proper communication and coordination with the engineer and contractor.
- Interpret and verify contractor compliance with drilled shaft installation plan items.
- Recognize and identify drilled shaft construction equipment and tools.
- Perform visual field verification of soil/rock material for comparison to supplied soil boring.
- Calculate percent recovery and Rock Quality Designation (RQD).
- Recognize and identify the various types of drilled shaft construction.
- Perform inspection of drilled shaft excavations for compliance to plans, construction tolerances and cleanliness.
- Recognize and explain pre-mix mineral and polymer slurry tests and various integrity tests.
- Verify reinforcing cage construction compliance including side spacers and SCL requirements.
- Determine theoretical shaft concrete volumes and develop concrete curves.
- Identify shaft “concreting” irregularities.
- Perform calculations for volume, area, circumference and elevation.
- Locate, explain, and apply applicable FHWA guide specifications/AASHTO/State DOT specifications relating to compliance.
- Identify potential problems and safety issues.
- Perform required reporting and pay quantity calculations.

Target Audience:

The primary audience is agency and consultant foundation or major structures inspectors. Additionally, project management and construction engineers in charge of drilled shaft construction inspection are encouraged to attend.

Technical Information	Peter Osborn	(401) 528-4550 peter.osborn@fhwa.dot.gov
NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Geotechnical

Course Number: 132078A

Course Title: Micropile Design and Construction

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course is directed toward the practicing geotechnical, foundation and structural engineer who has basic knowledge and experience in the design and construction of deep foundations. This course compares and contrasts micropiles with traditional deep foundation types, presents a stepwise procedure for the design of micropiles, and discusses aspects and issues concerning construction, inspection and integrity testing. Classroom presentations include exercises that will lead participants through the complete design of a micropile. The use of micropiles for slope stability applications is also discussed. Each participant will take away a notebook containing a complete micropile design, completed exercises and micropile reference manual.

Outcomes:

Upon completion of the course, participants will be able to:

- Perform geotechnical and structural design for micropiles in structural foundation support applications.
- Describe design concepts and methods for micropile slope stabilization and earth retention systems.
- Describe the difference between the various types of load tests and the different load test factors.
- Describe the construction process and testing of micropile systems to ensure compliance with the contracting specifications.
- Identify the items included in and appropriately apply the different types of specifications and contract.
- Evaluate if micropiles are likely to be an option that is viable and cost effective.

Target Audience:

Geotechnical specialists, foundation engineers, bridge engineers, and foundation construction engineers involved with the design and construction of structure foundations. The primary goal is to provide the target audience with guidance on when it is appropriate to use micropiles and the state-of-the-art in the design and construction of micropiles.

Technical Information	Barry Siel	(303) 716-2191 barry.siel@fhwa.dot.gov
NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Geotechnical

Course Number: 132079A

Course Title: Subsurface Investigation Qualification

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 30

Under development for Summer 2005

Description:

This course prepares students for a qualification/certification program for geotechnical field inspectors. The course follows FHWA specifications and practices for subsurface investigations. A partial list of topics addressed in the course are: Exploration equipment and methods; Safety; Borehole sealing; Drilling and sampling requirements and criteria; Proper soil and rock visual classification and descriptions; Common drilling errors; and Dealing with difficult subsurface site conditions. A two-hour qualification exam is administered at the end of the course.

Outcomes:

Upon completion of the course, participants will be able to:

- Define the role, duties and importance of the driller, drilling inspector and all other field personnel responsible for the quality of geotechnical subsurface investigation programs.
- Explain the need and importance of gathering quality subsurface data.
- Identify the equipment and tools used in the conduct of subsurface investigations.
- List key factors affecting subsurface investigation information, and their significance to the quality of the subsurface investigation program.
- Explain the logical steps to ensure proper communication and coordination with the engineer and responsible field personnel.

Target Audience:

This course is intended for drillers, drilling inspectors, engineers, geologists, and technicians involved in field data collection and quality assurance of subsurface investigations.

Technical Information	Ben Rivers	(404) 562-3926 benjamin.rivers@fhwa.dot.gov
NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Geotechnical

Course Number: 132080A

Course Title: Inspection of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 30

Course is under development for Fall 2005.

Description:

This course is part of a series to develop a training and qualification/certification program for geotechnical field inspectors. A partial list of topics addressed in the course are: Mechanically Stabilized Earth Wall (MSEW) and Reinforced Soil Slopes (RSS) types and durability; Construction methods and sequences; Alignment control; Methods of fill and compaction control; Plans, specifications and the geotechnical report; Shop drawings; and Safety. A two-hour qualification exam is administered at the end of the course.

Outcomes:

Upon completion of the course, participants will be able to:

- Identify basic MSEW and RSS types and design philosophy.
- Explain the role and duties of the MSEW and RSS inspector.
- Identify current construction practices for mechanically stabilized earth structure construction.
- Define key inspection elements for MSEW and RSS contract documents to assure compliance.
- Explain the logical steps to ensure proper communication with the engineer and responsible field personnel.

Target Audience:

The target audience will consist of inspectors, engineers, geologists, and technicians involved in field data collection and quality assurance for MSEW and RSS. Additionally, managers, specification and contracting specialists, bridge/structure, geotechnical, and roadway design engineers, and engineering geologists interested in construction aspects of MSEW and RSS structures are encouraged to attend.

Technical Information	Rich Barrows	(360) 619-7704 rich.barrows@fhwa.dot.gov
NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Geotechnical

Course Number: 133005A

Course Title: Highway Capacity and Quality of Flow

Fee: \$235 Interrupted flow facilities only. **Length:** 1.5 Days (CEU: 0.9 Units)

\$270 Choose either interrupted flow or uninterrupted 2 Days (CEU: 1.2 Units) flow facilities.

\$400 Per Participant 3 Days (CEU: 1.8 Units)

Class Size: Minimum 20; Maximum 30

The hosting organization is responsible for providing computers with 133 MHz Intel Pentium III or faster processors with Windows 95, NT or better, color monitors, 20 MB of available disk space and a minimum of 16 MB RAM. NOTE - Maximum of two participants per computer.

Description:

This course provides basic instruction in the use of the 2000 Highway Capacity Manual (HCM). Software is employed in most of the capacity analyses performed in the course. Approximately one-half of the course is dedicated to sessions on interrupted flow facilities (i.e., signalized intersections, unsignalized intersections and arterials). The remainder of the course covers freeways, weaving sections, ramps, multilane, and two-lane rural facilities. The course includes lectures describing the procedures for performing capacity analyses on each type of highway facility. Demonstrations and hands-on application of the highway capacity software are used to solve example and workshop problems.

Outcomes:

Upon completion of the course, participants will be able to:

- Explain facility characteristics and their limits as used in the HCM 2000.
- Explain analytical procedures and how to apply them.
- Use formulas by inputting data, reviewing and adjusting default values or adjusting factors, as necessary, for project and local conditions.
- Determine LOS from results.

Target Audience:

State, local, FHWA, contractors, and MPOs who design and analyze intersections, interface with freeways, deal with signal time issues, design and manage operations of urban streets, plan for type of intersections for future needs, work with system(s) monitoring and management of arterial systems or who conduct operational analysis to determine needs of highway facility, estimate the level of service for new/proposed and existing operations, and manage freeway systems.

Technical Information	John Halkias	(202) 366-2183 john.halkias@fhwa.dot.gov
NHI Training Program Manager	Bud Cribbs	(703) 235-0526 bud.cribbs@fhwa.dot.gov

Design and Traffic Operations

Course Number: 133010A

Course Title: Computerized Traffic Signal Systems

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course presents current technology and control options available for computerized traffic control, including microcomputer applications. The course covers the technical issues of a computerized traffic control system and steps necessary to develop and manage a system using the Systems Engineering Process. These steps begin with establishing system requirements, followed by understanding and combining system elements, evaluating and selecting the system, installation, as well as operation, maintenance and continuing system evaluation.

Outcomes:

Upon completion of the course, participants will be able to:

- Discuss and apply the Systems Engineering Process.
- Identify procedures for system feasibility and conceptual design.
- Identify signal system functional requirements and capabilities.
- Identify system components and configurations.
- Discuss signal timing and operational strategies.
- Identify system design documents and system implementation process.
- Identify operations, maintenance and performance evaluation elements.

Target Audience:

Traffic engineering personnel from State, Federal, and local agencies involved in the technical aspects of traffic engineering. The course will not assume any prior knowledge of computers and thus will describe the theory of operation and the manner in which it can be applied to traffic signal controls.

Technical Information	Pamela Crenshaw	(202) 366-1482 pamela.crenshaw@fhwa.dot.gov
NHI Training Program Manager	Bud Cribbs	(703) 235-0526 bud.cribbs@fhwa.dot.gov

Design and Traffic Operations

Course Number: 133028A

Course Title: Traffic Signal Design and Operation

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

Description:

There is a need to understand that the congestion and delays that exist on our streets and roadways can be managed better with a thorough understanding of effective traffic signal timing and optimization. Well developed, designed, implemented, maintained and operated traffic signal control projects are essential to this process. Engineering tools are available to design, optimize, analyze, and simulate traffic flow. This course addresses the application of the Manual of Uniform Traffic Control Devices (MUTCD) to intersection displays, as well as signal timing, computerized traffic signal systems, control strategies, integrated systems, traffic control simulation and optimization software. The course is divided into two primary parts: Traffic Signal Timing and Design, and Traffic Signal Systems.

Outcomes: Upon completion of the course, participants will be able to:

- List the steps required to plan, design, and implement a signalized intersection.
- Devise an appropriate data collection plan for planning, designing, and operating a signalized intersection.
- Perform a warrant analysis using the MUTCD warrants, including local policies.
- Design basic phasing of the intersection - which movements will get a separate phase, and how they are numbered.
- Calculate signal timing at the design stage for both actuated and coordinated operational strategies, including pedestrian clearance intervals.
- Determine location of signal displays.
- Select signal-related signs and pavement markings, including turning-movement signs and advance warning signs.

Target Audience:

The course is intended for those who will design and operate traffic signals within agencies. Examples of target participants include:

- Transportation professionals without previous traffic signal experience, particularly those that might be in charge of traffic signal programs and need a solid introduction to the topic.
- Recent engineering graduates and engineers moving into traffic signal design and operation from other disciplines.
- Traffic signal technicians who are responsible for design or operation of traffic signals.

Experience with simple engineering arithmetic is required. Some of the workshops include calculations that can be performed by hand or with a simple hand-held calculator. A few of the subjects are presented using mathematical formulas requiring experience with basic algebra. Participants should have good skills in converting units, such as: kilometers/hour to meters/second or miles/hour to feet/second.

Technical Information	Pamela Crenshaw	(202) 366-1482 pamela.crenshaw@fhwa.dot.gov
NHI Training Program Manager	Bud Cribbs	(703) 235-0526 bud.cribbs@fhwa.dot.gov

Design and Traffic Operations

Course Number: 133048A

Course Title: Managing Traffic Incident and Roadway Emergencies

Fee: \$4500 Per Session **Length:** 1 Day (CEU: 0.6 Unit) **Class Size:** Minimum 20; Maximum 35

\$6900 Per Session 2 Days (CEU: 1.2 Units)

Maximum number of participants for 1 and 2 day course can be increased with prior approval by NHI Training Program Manager. Per session course fees will adjust accordingly, dependent upon number of participants.

Description:

This course is part of the core ITS curriculum established by the ITS Professional Capacity Building (PCB) program. For more information on the core curriculum, go to URL: www.pcb.its.dot.gov/Catalogs/ITSCurriculum.htm#section2. This course addresses institutional and technical aspects of safe and efficient resolution of traffic incidents and other roadway emergencies. The course focuses on practices to obtain good inter-agency and inter-disciplinary understanding and cooperation.

Outcomes:

Upon completion of the course, participants will be able to:

- Recognize the program elements needed for a formalized multi-agency program to manage traffic incidents and roadway emergencies.
- Formulate techniques for effective on-site management of incidents.
- Identify technological solutions to facilitate the management of incidents.
- Develop a short-term list of 'next step' actions to improve multi-agency response to both major and minor traffic incidents.

Target Audience:

Persons at mid- or upper-management levels in various agencies who direct the resources of their agencies at the scene of a traffic incident or in response to an incident. Agencies that should be represented at workshops include: law enforcement, fire and rescue (including emergency medical), emergency communications, transportation (including traffic management and highway maintenance), planning, towing and recovery, traffic reporting media, hazardous materials contractors and other emergency management personnel responding to traffic emergencies on freeways.

Technical Information	David Helman	(202) 366-8042 david.helman@fhwa.dot.gov
NHI Training Program Manager	Bud Cribbs	(703) 235-0526 bud.cribbs@fhwa.dot.gov

Design and Traffic Operations

Course Number: 133072A

Course Title: High Occupancy Vehicle (HOV) Facilities

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 30
*Please call the Training Coordinator for more detailed information regarding different course options.
(New, late 2005.)*

Description:

The HOV Facilities training course will provide participants with a general appreciation and understanding of the key policies, technical, and other issues to consider in the planning, design, implementation, management, operation, and marketing of HOV facilities. HOV facilities are a proven and viable operational strategy to help move more people along congested urban and suburban routes. HOV facilities are a strategy to assist public agencies and transportation services providers to address the identified mobility, safety, productivity, environmental, and quality of life needs in metropolitan areas. The technical reference for this course is the NCHRP Report 414: HOV Systems Manual.

Outcomes:

Upon completion of the course, participants will be able to:

- Identify and discuss the concepts, goals and benefits of HOV facilities.
- Describe the public involvement and marketing techniques that may be appropriate in the planning, design, or operation of an HOV facility or system.
- Identify the different types of freeway and arterial HOV facilities, their operational characteristics, and the conditions where they may be successful.
- Identify the primary stakeholders involved with HOV systems along with the key policies, institutional issues, and interest to integrate into the planning, development, implementation, and operation of HOV facilities.
- Identify the major types of vehicles expected to use an HOV facility or regional system and the key operational characteristics to consider.
- Discuss the range of studies, methodologies, tools, and analysis appropriate to use in planning individual HOV facilities or a regional HOV system.
- Discuss the key roadway, operational, and enforcement issues to consider in the planning, design, and implementation phases of HOV facilities.

Target Audience:

Traffic engineers, transportation planners, roadway design engineers, transportation managers/supervisors, transit planners, transit managers/supervisors, and public information specialists who are involved in the planning, design, management, operations, and marketing of an HOV system. Pre-training Competencies: Individuals attending this course should have a basic understanding of traffic engineering or transportation planning principles, along with an appreciation of the elementary concepts of traffic management strategies, traffic flow theory, roadway improvement planning, project design processes, public outreach and marketing.

Technical Information	Jon Obenberger	(202) 366-2221 jon.obenberger@fhwa.dot.gov
NHI Training Program Manager	Bud Cribbs	(703) 235-0526 bud.cribbs@fhwa.dot.gov

Design and Traffic Operations

Course Number: 133075A

Course Title: Freeway Traffic Operations

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30
\$400 Per Participant 3 Days (CEU: 1.8 Units)

Description:

The purpose of the Freeway Traffic Operations training course is to provide participants with an appreciation of the key policies, institutional issues, challenges and barriers, technical and other issues to consider in the planning, design, implementation, management, operation, evaluation, and marketing of freeway facilities. The course is divided into 19 sessions, based on the information presented in the new Freeway Management and Operations Handbook. The course may be conducted in either a 3- or a 2-day format as determined by the local training coordinator.

Outcomes:

Upon completion of the course, participants will be able to:

- Identify the types and causes of congestion on freeway facilities.
- Compare the potential to improve traffic flow between roadway improvements vs. shorter-term/lower-cost operational improvements on freeway facilities.
- Describe the range of ramp management and control strategies and the conditions under which they might be warranted.
- Describe the range of lane management and control strategies and the conditions under which they might be warranted.
- List strategies for mitigating the impacts associated with planned special events.
- Identify the range of functions and elements of a transportation management system.
- List detection and surveillance techniques used to support freeway management and operations activities.

Target Audience:

Federal, State, and local transportation professionals involved in planning, design, and implementation of freeway improvement projects and the day-to-day management of travel and control of traffic on freeway facilities.

Technical Information	Neil Spiller	(202) 366-2188 neil.spiller@fhwa.dot.gov
NHI Training Program Manager	Bud Cribbs	(703) 235-0526 bud.cribbs@fhwa.dot.gov

Design and Traffic Operations

Course Number: 133078A

Course Title: Access Management, Location and Design

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course covers access management along streets and highways. General benefits, as well as the social, economic, political and legal implications of access control are examined. Existing access management practices and policies from States and jurisdictions are used as examples of what types of programs have been implemented and how effective they have been. Through in-depth discussion, access management techniques and the warrants for their use are reviewed. Guidelines for design and application of these access management techniques are described in detail. Strategies for developing and implementing retrofit programs to improve existing access control are presented. The course presents several “before” and “after” case studies, that show the impacts of retrofit programs on local businesses. Techniques and procedures for evaluating the impacts of access control on the safety and operations of the highway system are also covered.

Outcomes:

Upon completion of the course, participants will be able to:

- Recognize the various elements involved in planning, developing, implementing, and administering an effective access management program.
- Assess the safety and operational impacts of alternative access management techniques.
- Demonstrate convincingly the merits of obtaining and maintaining good access management along streets and highways.

Target Audience:

This course is designed for Federal, State, and local planners and engineers who are currently involved or expect to be involved in decisions on, and/or design of, access to existing or new sites.

Technical Information	Neil Spiller	(202) 366-2188 neil.spiller@fhwa.dot.gov
NHI Training Program Manager	Bud Cribbs	(703) 235-0526 bud.cribbs@fhwa.dot.gov

Course Title: Principles of Writing Highway Construction Specifications

The National Highway Specifications web site is now available at <http://www.specs.fhwa.dot.gov>.

This course addresses the engineering, legal, and linguistics aspects of writing specifications. **THIS IS NOT A COURSE IN TECHNICAL WRITING!** The course addresses how to draft new specifications or rewrite existing ones in clear, readable, and definitive statements of contract requirements. Classroom activities include: lectures, case studies, workshops and writing assignments. The course covers method and end-result specifications; innovative methods to deliver, procure, and manage construction; general provisions and a section on end-result related specifications. The course also includes a discussion of the importance of obtaining feedback from all the entities involved in interpreting and using the specifications in order to make them work better in the field.

Upon completion of the course, participants will be able to:

- Apply the principles to write clear, concise, complete, and technically correct specifications.
- Write specifications in the active voice imperative mood.
- Write specifications without ambiguities and with measurable standards.
- Describe the difference between traditional methods specifications and statistically-based quality assurance specifications.
- Identify newer types of procurement and contracting methods.
- Demonstrate appreciation for the importance of specifications for highway construction contracting.

Personnel working in contract administration, design, materials selection and quality control, and the management of highway construction, including contribution of information in contract provisions. This includes specification writers who use the information in writing the formal contract documents.

PREREQUISITES: This course is not for beginners! Participants must have experience (five years minimum) in at least one of the following disciplines: Contract Administration, Materials, Specification Writing, Roadway or Bridge Design, Roadway or Bridge Construction.

Technical Information	Chris Newman	(202) 366-2023 christopher.newman@fhwa.dot.gov
NHI Training Program Manager	John Taylor	(703) 235-0524 john.taylor@fhwa.dot.gov

Construction and Maintenance

Course Number: 134005A

Course Title: Value Engineering Workshop

Fee: \$650 Per Participant **Length:** 5 Days (CEU: 3 Units) **Class Size:** Minimum 20; Maximum 30

Description:

Value Engineering is the systematic process of review and analysis of a project during its design/development phase to provide suggestions for reducing its total cost while providing an equal or better quality project. A Value Engineering review is made by a multi-disciplined team who: (1) investigate/analyze the design of an existing project; (2) analyze project functions and costs; (3) creatively speculate on alternative ways to perform the various functions; (4) evaluate the best and/or least life-cycle alternatives; (5) develop acceptable alternatives into fully supported recommendations; and (6) present the team's recommendations to management. This workshop provides the Value Engineering education necessary for the participants to successfully participate in future value studies. It also encourages formation of interactive Value Engineering teams at the State and division office levels. The workshop incorporates value analysis of actual projects furnished by the host agency.

Outcomes: Upon completion of the course, participants will be able to:

- Recognize the difference between Value Engineering and other cost reduction or problem solving techniques.
- Identify areas where the application of Value Engineering techniques have potential for savings in financial or material resources.
- Participate in a Value Engineering team and provide guidance to team members who have less experience.
- Support the use of Value Engineering, recognizing it as a management tool for product improvement and cost reduction.

Target Audience:

Professional and technical staff of FHWA and State highway/transportation departments, including officials of local transportation agencies involved in recurrent Federal-aid work.

Technical Information	Donald Jackson	(202) 366-4630 donald.jackson@fhwa.dot.gov
NHI Training Program Manager	John Taylor	(703) 235-0524 john.taylor@fhwa.dot.gov

Construction and Maintenance

Course Number: 134006A

Course Title: Highway/Utility Issues

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

This course is designed to include participants from highway agencies and from utilities. Hosting agencies should make every effort to ensure both are present.

Description:

This course presents the fundamentals of effective coordination of utility relocation and accommodation issues throughout the planning, design, construction, and maintenance phases of a highway project. Participants from both highway and utility communities will be involved throughout the course, demonstrating their knowledge through workshops, exercises, and other activities. The course will include methods for measuring the attainment of learning objectives. Two instructors will facilitate the course, one experienced in highway matters, the other in utility matters.

Outcomes: Upon completion of the course, participants will be able to:

- Locate utility issues and concerns during the project development process and flag opportunities for early coordination.
- Identify the critical processes related to utilities for permits, relocation, and project construction.
- Be able to read a plan and profile sheet.
- Be able to use templates for creating a simple plan for establishing the proper traffic control plan (TCP).
- Describe successful practices that might be considered as options for each phase of a project.

Target Audience:

Federal, State, and local highway agencies, and public/private utility companies responsible for highway/utility coordination.

Technical Information	Roger McClellan	(202) 366-6765 roger.mcclellan@fhwa.dot.gov
NHI Training Program Manager	John Taylor	(703) 235-0524 john.taylor@fhwa.dot.gov

Course Number: 134029A

Course Title: Bridge Maintenance Training

Fee: \$530 Per Participant **Length:** 4 Days (CEU: 2.4 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course focuses on cost-effective bridge maintenance and repair procedures performed by typical transportation agency crews. Included are step-by-step instructions for preparing for and performing maintenance and repair on common bridge elements. Bridge preservation is emphasized throughout. While engineers often attend, the material is designed for bridge crew supervisors and technicians.

Outcomes: Upon completion of the course, participants will be able to:

- Justify, develop and implement a cost-effective preservation strategy for a group of bridges.
- Identify maintenance or repair needs and select the best remedial strategy.
- Understand properties and preservation options involving common bridge materials such as concrete, steel and timber.
- Describe the step-by-step tasks required to accomplish proven preservation procedures on the various bridge elements.
- Identify critical members and avoid procedures that might result in damage such as field welding repairs on fracture critical tension members.
- Recognize problems that warrant specialized expertise, for example, soliciting the involvement of a qualified structural engineer when repairing structural damage.
- Exercise effective management techniques (such as planning, scheduling, monitoring and reporting) during daily bridge maintenance operations.

Target Audience:

State and local bridge maintenance technicians and supervisors.

Technical Information	George Romack	(202) 366-4606 george.romack@fhwa.dot.gov
NHI Training Program Manager	John Taylor	(703) 235-0524 john.taylor@fhwa.dot.gov

Construction and Maintenance

Course Number: 134037A

Course Title: Managing Highway Contract Claims: Analysis and Avoidance

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

Description:

The course is structured such that emphasis can be given to scheduling (using CPM) or to documentation and preparation of legal actions caused by claims. This option should be stated when requesting the course. The course manual and classroom instruction addresses the following areas:

- Philosophy/Concept of Construction Contracting, Changes and Claims Competitive Bidding/Reliance on Plans and Specifications Why Claims Have Increased
- Construction Contracts in Laymen's Language Basic Contract Principles Significant Contract Clauses/Changes, Differing Site Conditions, Liquidated Damages, Suspension of Work, Termination, Inspection, Acceptance Indemnification Clauses
- Strengths and Weaknesses of State Highway Contracts
- Preparing Contract Documents
- Contract Administration Directed and Constructive Changes Procedures (Notice, Equitable Adjustment/ Force Account, Timeliness Scheduling Cost Evaluations)
- Delay Claims/Inefficiency/Damages Exculpatory Language, Excusable and Inexcusable Delays Acceleration, Disruptions, Interferences, Performing Delay Analysis, Damage Calculations (mitigation)
- Documentation and Recordkeeping Bid Documents, Periodic Reports, Schedules, Internal and External Correspondence, Photographs, Use as Evidence
- Managing Claims Identification, Procedures, Preparation/Claim Defense Plan Strategy, Claim Presentation
- Negotiation Timing, Strategy, Team Approach (Workshop)
- Design Consultant Liability
- Disputes Resolution Litigation, Arbitration, Administrative Procedures Alternate Disputes Resolution
- How to Prepare for Trial/Arbitration Depositions, Trial, Preparation of Exhibits/Consultants Working with Attorneys

Outcomes:

Upon completion of the course, participants will be able to:

- Define the recommended terminology associated with claims and the accompanying dispute resolution process.
- Identify the three key elements of a claim.
- Determine whether or not a change has occurred.
- Measure the impacts of the change.
- Calculate the resultant cost of the change.
- Explain the value of a systems approach to claims avoidance.
- Identify the dispute resolution procedures available to the host.

Target Audience:

This course is intended for FHWA, State, and local highway design and construction engineers, resident engineers, or individuals one step above the project level involved in project development, specification writing, and individuals involved in the preparation for the defense of a construction.

Technical Information	Chris Newman	(202) 366-2023 chris.newman@fhwa.dot.gov
NHI Training Program Manager	John Taylor	(703) 235-0524 john.taylor@fhwa.dot.gov

Construction and Maintenance

Course Number: 134042A

Course Title: Materials Control and Acceptance - Quality Assurance

Fee: \$600 Per Participant **Length:** 4.5 Days (CEU: 2.7 Units) **Class Size:** Minimum 20; Maximum 30

Description:

The course provides participants with an understanding of the basic elements of a statistically-based quality assurance program. The following sessions are included in the course: Introduction, Sampling Theory, Organization of Data, Analysis of Data, The Normal Distribution, Sources of Variability, Process Control, Acceptance Plans and Risks, Percent Within Limits Acceptance Plans, Implementation and Summary.

Outcomes:

Upon completion of the course, participants will be able to:

- Recognize the importance of organizing data, necessary forms of data organization and how to plot frequency histograms.
- Recognize how a sample relates to the population, including the myth of a single representative sample, establish and use random stratified sampling plans.
- Calculate population and sample means standard deviations and coefficient of variation.
- Recognize the relationship between single and multiple samples.
- Recognize basic probability concepts, illustrate the relationship of histograms to probability density functions and calculate areas under normal distribution curves.
- Explain the meaning of the terms precision, accuracy, and bias.
- Identify sources of variability and how to use precision and bias statements.
- Develop and apply process control plans, including how to calculate control chart limits and to plot and interpret statistical control charts.
- Recognize the strengths and weaknesses of acceptance plans based on sample means and percent within limits.
- Recognize the different types of specifications and how they work, including the inputs to specifications and requirements for the use of contractors.
- Recognize the elements of acceptance plans, including buyer and seller risks.
- Recognize the elements of a quality assurance system.

Target Audience:

Federal, State, and local highway agency engineers in materials, construction, research and other highway fields and technicians involved in specification development, laboratory, and field testing of highway materials.

Technical Information	Michael Rafalowski	(202) 366-1571 michael.rafalowski@fhwa.dot.gov
NHI Training Program Manager	John Taylor	(703) 235-0524 john.taylor@fhwa.dot.gov

Construction and Maintenance

Course Number: 134049A

Course Title: Use of Critical Path Method (CPM) for Estimating, Scheduling and Timely Completion

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This training course is designed to educate State highway, FHWA, and industry project staff about the availability of effective construction and maintenance planning and scheduling tools that can help in providing visual representation of current project status, completed tasks, and expected completion of all activities. These tools can be focused to accelerate construction and minimize impact on the traveling public.

Outcomes:

Upon completion of the course, participants will be able to:

- Create a CPM chart for a sample project using these basic components: a project definition, milestones and a Gantt chart, work schedules (including work breakdown schedules), and an activity network.
- Calculate resource needs and reserves, and propose resource leveling strategies.
- Prepare a risk analysis/management plan for the sample project.
- Use a complex CPM to determine the status of the project, identifying slack or float and delays.
- Describe methods for managing multi-project scheduling.

Target Audience:

Federal, State, local and private contractor project engineers/managers and related field personnel.

Technical Information	Celso Gatchalian	(202) 366-1342 celso.gatchalian@fhwa.dot.gov
NHI Training Program Manager	John Taylor	(703) 235-0524 john.taylor@fhwa.dot.gov

Construction and Maintenance

Course Number: 134056A

Course Title: Pontis Bridge Management

Fee: \$335 Per Participant **Length:** 2.5 Days (CEU: 1.5 Units) **Class Size:** Minimum 10; Maximum 20
In addition to the 2.5-day training, a 2-hour session has been developed as part of the course to serve as an introduction to the attributes and benefits of the Pontis program. This introduction is designed for Federal, State and local executives and upper and mid-level highway agency professionals responsible for an agency's bridge/highway program. Executives and management officials are encouraged to attend the opening introduction and overview sessions.

Description:

Pontis is a computer software program, owned and licensed by AASHTO, designed to assist bridge managers and practitioners in analyzing bridge data to predict future bridge conditions and needs, determine optimal policies, and recommend projects and schedules within budget and policy limitations. The course covers entering and editing inspection data, developing a bridge preservation policy, performing bridge network level analyses, developing bridge projects, running Pontis reports, and refining Pontis results. The course focuses on an agency's business process steps, key concepts of bridge management and their application to Pontis, using the software, instructor demonstration exercises, and practical student exercises. Each participant will receive a participant notebook. Six laptop computers containing the PONTIS 4.0 software and sample training database are furnished by the NHI for use in the training course.

Outcomes:

Upon completion of the course, participants will be able to:

- Use Pontis to support bridge management.
- View, enter and edit bridge inspection and inventory data.
- Develop, update, optimize and interpret a preservation policy.
- Enter program simulation inputs, run network analyses and interpret results.
- Create and rank bridge projects.
- Generate and interpret reports.
- Customize Pontis to support agency business practices.

Target Audience:

This course is designed for bridge program managers, bridge management engineers, bridge maintenance engineers, bridge inspectors, and project planning and programming personnel.

Technical Information	George Romack	(202) 366-4606 george.romack@fhwa.dot.gov
NHI Training Program Manager	John Taylor	(703) 235-0524 john.taylor@fhwa.dot.gov

Hydraulics

Course Number: 135010A

Course Title: River Engineering for Highway Encroachments

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 30

Description:

The course provides training in the theory and application of alluvial channel flow, fluvial geomorphology, sediment transport, and river mechanics to the planning, location, design, construction, maintenance and operation of highways. Material for this course comes from Hydraulic Design Series 6 (HDS-6) and includes detailed coverage of sediment transport equations and computations. Additional topics include: stream gauging, sediment properties, sediment measurement, and river training. Case histories provide practical examples of problems that occur at highway crossings and encroachments of streams and rivers, and a computer generated 360 degree virtual tour site visit is used for a comprehensive workshop. Example problems will be worked by the course participants.

Outcomes:

Upon completion of the course, participants will be able to:

- Apply open channel flow equations and concepts in the design and evaluation of highway hydraulic structures.
- Determine resistance to flow and sediment transport at highway crossings.
- Apply sediment transport and sediment continuity relationships for the analysis of stream bed degradation and aggradation.
- Evaluate the interrelationships between fluvial (river) geomorphology and hydraulic design.
- Integrate river mechanics equations, concepts and principles into the design, maintenance, evaluation and inspection of highways in the river environment.

Target Audience:

Engineers who are responsible for the evaluation of stream stability and the design of highway hydraulic structures. The course is designed for graduate engineers (BS) who have been trained in basic hydraulics of rigid-boundry, open channel flow.

Technical Information	Larry Arneson	(303) 716-2144 larry.arneson@fhwa.dot.gov
NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Hydraulics

Course Number: 135027A

Course Title: Urban Drainage Design

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 30
\$530 Per Participant 4 Days (CEU: 2.4 Units)

Description:

This course provides a detailed introduction to urban roadway drainage design. Design guidance for solving basic problems encountered in urban roadway drainage design is provided. Topics to be discussed:

- Hydrology
 - Rational Equation
 - Soil Conservation Method
 - Regression Equations
 - Synthetic Hydrographs
- Highway Drainage
 - Gutter Flow
 - Roadway Inlet Interception
 - Storm Drain Systems
 - Energy and Hydraulic Grade Lines
 - Detention Ponds
 - Storm Water Management

The 4-day course includes the basic 3-day course, plus presentation of the 1-day course 135028 - Stormwater Pump Station Design.

Outcomes:

Upon completion of the course, participants will be able to:

- Determine runoff (peak flows and volumes) from urban watersheds.
- Apply basic hydraulic principles to urban drainage design.
- Perform roadway drainage designs using various roadway inlets.
- Size and/or analyze storm drain conveyance systems.
- Establish the energy and hydraulic grade lines for storm drains.
- Design and/or analyze detention basins.
- Perform hydraulic design of pumping stations (with optional day 4).

Target Audience:

Highway designers with limited experience in drainage design, but familiar with mathematical concepts such as algebra and geometry and have some working background in hydrology.

Technical Information	Dan Ghery	(708) 283-3557 dan.ghery@fhwa.dot.gov
NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Hydraulics

Course Number: 135028A

Course Title: Stormwater Pump Station Design

Fee: \$200 Per Participant **Length:** 1 Day (CEU: 0.6 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course provides an overview of the location and type selection of stormwater pump stations. A major portion of the course is devoted to recommended hydraulic design procedures for sizing and optimizing stormwater pump stations. This course is also offered as a one day add-on to NHI Course No. 135027 - Urban Drainage Design. Topics to be discussed include:

- Site Considerations
- Hydrology
- Storage
- Pump Configuration
- Mass Curve Routing
- Pump Selection
- Sump Dimensions
- Mechanical and Electrical Considerations

Outcomes:

Upon completion of the course, participants will be able to:

- Determine locations where pump stations are appropriate.
- List types of pumps and pump stations.
- Apply basic hydraulic principles to accomplish graphical mass curve routing.
- Size pumps and determine start/stop elevations.
- Determine storage volume needed.
- Size wet wells according to industry standards.

Target Audience:

Highway designers with some experience in storm drainage design, familiarity with mathematical concepts such as algebra and geometry and have a working background in hydraulics and hydrology.

Technical Information	Dan Ghere	(708) 283-3557 dan.ghere@fhwa.dot.gov
NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Hydraulics

Course Number: 135041A

Course Title: HEC-RAS, River Analysis System

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 30
\$460 Per Participant 3.5 Days (CEU: 2.1 Units)

The host is responsible for providing 15 computers with the following minimum configuration: 850 MHz Intel Pentium® III Processor or equivalent with 128 MB RAM, Windows NT 4.0 with Service Pack 6a or 98 Second Edition or 95 (SR-1), 100 MB available disk space, CD-ROM drive, and 1024 x 768 color video display.

Description:

HEC-RAS is a computer program designed as the successor to the U.S. Army Corps of Engineers' Hydraulic Engineering Circular HEC-2, Water Surface Profiles program (WSPRO). The program incorporates the Standard Step Method for Water Surface Profile computations, bridge hydraulics, including the method presented in WSPRO, culvert hydraulics, flood encroachments, design of open channel flow, analyzing split flow options and sub and supercritical flow computations. The program can be used to compute bridge pier and abutment scour following the HEC-18 guidelines. The program is Windows-based and uses a Graphical User Interface for file management, data entry and editing, program execution and output display. It provides easy conversion from English to metric. Both courses provide an overview and hands-on experience with the computer program including modeling of bridges, but the 3.5-day version adds coverage of culvert modeling or multiple-opening bridges. A representative from the host agency is encouraged to contact the instructor when setting up the course to determine which length course would best suit the needs of the course participants and, if the 3.5-day version is requested whether coverage of culverts or multiple-opening bridges is preferred. Each participant will receive a notebook containing the course notes, and a CD containing user documentation, HEC-RAS software and example computer workshops.

Outcomes:

Upon completion of the course, participants will be able to:

- Apply the conservation of mass, energy and momentum to computations of water surface profiles, hydraulics of bridges and the hydraulics of culverts.
- Create cross section, bridge and culvert data files.
- Create flow files.
- Run the HEC-RAS computer program to solve all applications as presented in this course.
- Troubleshoot the output data to determine the validity of the results.

Target Audience:

Federal, State and local hydraulic engineers who have responsibility for the design and analysis of river systems and stream crossings. Participants should have experience in using the Windows environment and knowledge of the fundamentals of open channel flow, including basic understanding.

Technical Information	Larry Arneson	(303) 716-2144 larry.arneson@fhwa.dot.gov
NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Hydraulics

Course Number: 135046A

Course Title: Stream Stability and Scour at Highway Bridges

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 30

See NHI Course No. 135047 for a description of the 1-day course for bridge inspectors.

Description:

This course provides comprehensive training in the prevention of hydraulic-related failures of highway bridges. The effects of stream instability, scour, erosion and stream aggradation and degradation are covered. Material for the 3-day course comes primarily from two Hydraulic Engineering Circulars (HEC), "Evaluating Scour at Bridges" (HEC-18), and "Stream Stability at Highway Structures" (HEC-20).

The course provides training in conducting a stream stability classification and qualitative analysis of stream response. Quantitative techniques are provided for estimating long-term degradation, and calculating the magnitude of general and local scour at bridge piers and abutments for simple and complex substructures. A comprehensive workshop integrates qualitative analysis and analytical techniques to determine the need for a plan of action for correcting stream instability and scour problems.

NHI Course No. 135048 is a recommended subsequent course that provides training in the selection and design of countermeasures for stream instability and scour problems, including development of a plan of action and an introduction to fixed and portable instrumentation for scour monitoring.

Outcomes:

Upon completion of the course, participants will be able to:

- Identify stream instability and scour problems at bridges.
- Define problems caused by stream instability and scour.
- Estimate the magnitude of scour at bridge piers and abutments and in the bridge reach.

Target Audience:

Federal, State and local highway hydraulic, structural, and geotechnical engineers and bridge inspectors responsible for maintaining the integrity of highway bridges against possible hydraulic related problems. Consultants who do bridge engineering work are encouraged to attend.

Technical Information	Larry Arneson	(303) 716-2144 larry.arneson@fhwa.dot.gov
NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Hydraulics

Course Number: 135047A

Course Title: Stream Stability and Scour at Highway Bridges for Bridge Inspectors

Fee: \$200 Per Participant **Length:** 1 Day (CEU: 0.6 Unit) **Class Size:** Minimum 20; Maximum 30

See NHI Course No. 135046 for a description of the 3-day course for identifying and analyzing stream stability and scour problems at highway bridges.

Description:

This course is an abbreviated presentation of NHI Course No. 135046. The course provides an understanding of and assistance in detecting hydraulic-related problems at highway bridges. The effects of stream instability, scour, erosion, and stream aggradation and degradation are covered. Countermeasures to these problems are discussed. This course concentrates on visual keys to detecting scour and stream instability problems and provides an introduction to portable scour monitoring instrumentation. The course emphasizes inspection guidelines to complete the hydraulic and scour-related coding requirements of the National Bridge Inspection Standards (NBIS). This course can be offered as a 1-day module in conjunction with the 3-day NHI Course No. 135046 or as a stand-alone presentation.

Outcomes:

Upon completion of the course, participants will be able to:

- Identify stream instability and scour problems at bridges.
- Conduct field evaluations for scour and stream instability problems and properly code the results in the National Bridge Inventory.
- Recognize countermeasures for stream instability and scour.

Target Audience:

Federal, State and local highway bridge inspectors responsible for detecting possible hydraulic-related problems that may threaten the integrity of highway bridges. Consultants who do bridge inspection work for the States may attend if space is available.

Technical Information	Larry Arneson	(303) 716-2144 larry.arneson@fhwa.dot.gov
NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Hydraulics

Course Number: 135048A

Course Title: Countermeasure Design for Bridge Scour and Stream Instability

Fee: \$335 Per Participant **Length:** 2.5 Days (CEU: 1.5 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course provides an overview of countermeasures to highway related failures from the effects of stream instability, scour, erosion and stream aggradation and degradation problems. Material for the 2.5-day course comes primarily from Hydraulic Engineering Circular (HEC) "Bridge Scour and Stream Instability Countermeasures - Experience, Selection, and Design Guidance" (HEC-23). Given a stream instability and scour problem, participants will select appropriate countermeasures to correct the problem. The course provides training in recommended strategies for developing a plan that includes appropriate countermeasures, including alternatives to conventional riprap and filter design. Participants will apply hydraulics analysis techniques to countermeasure design for seven design guideline workshops. The course provides an introduction to fixed and portable instrumentation for scour monitoring using slides and video demonstrations. Participants will receive training in designing a monitoring program to reduce the risk from scour. NHI Course No. 135046 provides training in identifying and analyzing stream instability and scour problems at highway bridges and is recommended as a prerequisite for this course.

Outcomes:

Upon completion of the course, participants will be able to:

- Develop a plan of action for a scour critical bridge.
- Propose countermeasures for stream instability and scour problems.
- Identify countermeasures for bridge scour and stream instability using the HEC-23 countermeasures matrix.
- Design selected countermeasures with HEC-23 design guidelines.

Target Audience:

Federal, State and local highway hydraulic, structural, and geotechnical engineers and bridge inspectors responsible for maintaining the integrity of highway bridges against possible hydraulic-related problems. Consultants who do bridge engineering work are encouraged to attend.

Technical Information	Larry Arneson	(303) 716-2144 larry.arneson@fhwa.dot.gov
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Hydraulics

Course Number: 135056A

Course Title: Culvert Design

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course provides participants with the recommended design procedures for the hydraulic design of culverts. Material for the 3-day course comes primarily from “Hydraulic Design of Highway Culverts,” Hydraulic Design Series No. 5 (HDS-5), which is provided to participants. “Hydraulic Design of Energy Dissipators for Culverts and Channels” (HEC-14) is discussed, but not provided. Culvert Hydraulic Design/Analysis Computer Program (HY-8) is discussed and demonstrated. However, this is not a “hands-on” computer course. A portable hydraulic flume is set up in the classroom for the participants to observe hydraulic principles and the hydraulic effects of culverts, improved inlets, pipe slope, material roughness and various end treatments. The participants measure velocity, discharge and headwater in the flume under various conditions and use the information to make actual design calculations.

Outcomes:

Upon completion of the course, participants will be able to:

- Identify design alternatives based on culvert type, material, shape and service life considerations.
- Describe the factors that govern inlet and outlet control and describe how each factor influences culvert performance.
- Calculate tailwater depth and velocity and describe how tailwater affects culvert performance.
- Design conventional culverts using HDS-5.
- Improve culvert performance for inlet control culverts by designing an improved inlet using HDS-5.
- Evaluate culvert outlet velocity and the need for energy dissipators, and select alternative energy dissipators using HEC-14.
- Identify appropriate computer programs for culvert and energy dissipator design.

Target Audience:

The course is suitable for entry level personnel who have some drainage design experience or have taken NHI Course No. 135065A and is valuable as a refresher course for those with previous culvert design training or experience.

Technical Information	Joseph Krolak	(410) 962-0091 joseph.krolak@fhwa.dot.gov
NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Hydraulics

Course Number: 135065A

Course Title: Introduction to Highway Hydraulics

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course is based on Hydraulic Design Series No. 4 (HDS-4), "Introduction to Highway Hydraulics." The objective of the course is to provide a broad overview of basic highway drainage concepts. Fundamental hydraulic concepts are discussed, followed by open-channel flow principles and design applications of open-channel flow in highway drainage, including the design of stable channels, and pavement drainage. Closed-conduit concepts and applications in highway drainage include the application of culvert and storm drainage design. The presentation concludes with an introduction to concepts and design of energy dissipaters. Detailed design criteria are drawn from other Hydraulic Design Series manuals and Hydraulic Engineering Circulars, providing a broad overview of all components of highway drainage design with an emphasis on practical applications. A portable hydraulic flume is set up in the classroom for the participants to observe numerous hydraulic principles. The participants take velocity and discharge measurements from the flume while in various setups and use the information to make design calculations.

Outcomes:

Upon completion of the course, participants will be able to:

- Calculate design discharge using the Rational Method or Regression Equation procedures.
- Apply the continuity and energy equation to solve practical design problems.
- Use the Weir equation to calculate the flow overtopping a roadway embankment.
- Use Manning's equation to calculate velocity or flow depth in simple or compound channels and recognize when this equation cannot be appropriately applied.
- Evaluate channel flow conditions (subcritical, critical or supercritical) using the Froude number.
- Design a stable channel using basic hydraulic concepts and Hydraulic Engineering Circular (HEC)-15.
- Apply basic pavement drainage concepts in calculation procedures described in HEC-22.
- Design a simple culvert crossing using the procedures in HDS-5.
- Design a simple storm drain and calculate the Hydraulic Grade Line (HGL) using the energy equation and HEC-22.
- Describe which energy dissipaters are useful for culvert or storm drain applications based on HEC-14.

Target Audience:

Entry level engineers or engineering technicians who are performing highway drainage calculations on transportation facilities. It will also be useful as a refresher course on hydraulic fundamentals for experienced personnel.

Technical Information	Jorge Pagan	(202) 366-4604 jorge.pagan@fhwa.dot.gov
NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Hydraulics

Course Number: 135067A

Course Title: Practical Highway Hydrology

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 30

Description:

The course provides engineers and designers with the knowledge and practical application of hydrologic principles to highway design. Participants will be required to work example problems that stress actual design situations. The course is based on the Hydraulic Design Series (HDS) No. 2, "Highway Hydrology" which is also used in the course as a reference manual.

Participants will learn how to select and effectively implement techniques for estimating peak flows and flood hydrographs in gaged and ungaged streams for watersheds of the size typically encountered in highway drainage design. Through a series of optional modules, additional topics including channel routing, wetland hydrology, arid lands hydrology, and snowmelt hydrology are available, given host agency preferences.

The overall course objectives enhance the understanding of basic hydrologic concepts and principles as they pertain to highways, and enable application of appropriate hydrologic concepts and tools in the design of drainage facilities and hydraulic structures.

Outcomes:

Upon completion of the course, participants will be able to:

- Identify which peak flow design methods are suitable for given watershed characteristics and design requirements.
- Estimate times of concentration.
- Analyze gage flows using Log-Pearson III Frequency Analysis.
- Apply the SCS, regression and Rational methods for peak flows.
- Develop hydrographs using the unit hydrograph and other techniques.
- Perform storage routing calculations.
- Design a storm water management facility.

Target Audience:

Highway engineers and designers who are responsible for designing the storm water storage, channels, and storm drains, as well as those involved in the hydraulic design of bridges and culverts. Attendees will benefit from, but are not required to have, a basic knowledge of hydrologic science. The course is a useful primer for those new to the subject as well as a thorough review for experienced hydrologic and hydraulic engineers.

Technical Information	Joseph Krolak	(410) 962-0091 joseph.krolak@fhwa.dot.gov
NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Hydraulics

Course Number: 135071A

Course Title: Surface Water Modeling System with FESWMS and SMS

Fee: \$650 Per Participant **Length:** 5 Days (CEU: 3 Units) **Class Size:** Minimum 20; Maximum 26

The host is responsible for providing 15 computers with the following minimum configuration: 850 MHz Intel Pentium® III Processor or equivalent with 128 MB RAM, Windows NT 4.0 with Service Pack 6a or 98 Second Edition or 95 (SR-1), 100 MB available disk space, CD-ROM drive, and 1024 x 768 color video display.

Description:

The course presentation provides a balance of hydraulic theory, background of the finite element method, data requirements necessary to operate the Finite Element Surface Water Modeling System (FESWMS) computer program and the use of Surface-Water Modeling System (SMS) in the development of input data files and the analysis of the data output.

The FESWMS is a depth averaged two-dimensional surface water model for analyzing complex flow patterns in river or tidal situations. The program has been designed for modeling bridges and hydraulic structures commonly found in highway hydraulic applications. The program is capable of modeling bridges, bridges in pressure flow, culverts, weir flow over the roadway, and general and local scour through the reach being analyzed. The model is capable of handling steady and unsteady flow through hydraulic systems. Because of the intensive input data requirements and large amounts of output generated by the FESWMS computer program, the pre- and post-processing program SMS is used in the course. SMS is capable of interactively building finite element networks, including the input data files necessary to use the FESWMS computer program. The program is also capable of graphically presenting the output from FESWMS, using a variety of formats.

Participants will receive a notebook that includes: course materials, a FESWMS User's Manual and SMS User's Manual, including copies of the software used in the course. Non-State highway agency course participants will receive a demonstration version of the proprietary SMS computer program.

Outcomes:

Upon completion of the course, participants will be able to:

- Apply the fundamentals and use the capabilities of the FESWMS computer program to develop two-dimensional water surface elevations and velocity fields.
- Develop input data necessary for use in the FESWMS computer program.
- Use SMS as a pre- and post-processing program for the FESWMS computer program.
- Use SMS to build finite element networks and input data files for use with the FESWMS computer program, including to graphically view and manipulate the output.

Target Audience:

Federal, State, and local hydraulic engineers who have responsibility for the design and analysis of highway stream crossings. In order to derive the most benefit from this training, course participants should have knowledge of the fundamentals of open channel flow and should be familiar with the general concepts associated with two-dimensional surface water flow modeling. Experience with Windows-based computer programs is helpful.

Technical Information	Larry Arneson	(303) 716-2144 larry.arneson@fhwa.dot.gov
NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Hydraulics

Course Number: 135080A

Course Title: Hydrologic Analysis and Modeling with WMS

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 25
The host is responsible for providing 15 computers with the following minimum configuration: 850 MHz Intel Pentium® III Processor or equivalent with 128 MB RAM, Windows NT 4.0 with Service Pack 6a or 98 Second Edition or 95 (SR-1), 100 MB available disk space, CD-ROM drive, and 1024 x 768 color video display.

Description:

This course is designed as a hands-on, application-oriented training course using the Watershed Modeling System (WMS) to make hydrologic estimates using a variety of techniques. It will provide attendees with the knowledge and tools necessary to use data derived from geographical information systems (GIS) to develop hydrologic estimates and model runoff from watersheds. The course also teaches how to use digital terrain data for the development of watershed parameters that are required by most commonly used hydrologic analysis programs.

The WMS is a comprehensive environment for hydrologic analysis. It was developed by the Environmental Modeling Research Laboratory (EMRL) of Brigham Young University, and is licensed for use by all State and Federal highway agencies. WMS makes it possible to take advantage of the wealth of digital terrain, land use, soil, and other GIS data readily available from government and private agencies. This data can then be used for preparing input files for several commonly used hydrologic models. Models supported by the interface include HEC-1 (HMS), TR-20, TR-55, and the Rational Method. This course also includes instruction in use of the regional regression equations contained in the National Flood Frequency (NFF) database. This course teaches the techniques and methods necessary to locate and use GIS data so that labor intensive processes such as delineating watershed boundaries and calculating modeling parameters from paper maps can be avoided when computing design flows and developing flow hydrographs at bridges and culverts.

Participants will receive a notebook that includes course materials, a WMS User's Manual, and copies of the software, workshops, and tutorials used in the course. Non-State highway agency course participants will receive a demonstration version of the proprietary WMS computer program.

Outcomes:

Upon completion of the course, participants will be able to:

- Automate basin delineation in WMS with GIS vector data, DEMs, and TINs.
- Efficiently use digital watershed data for hydrologic modeling parameter development.
- Locate and obtain digital data sources for watershed delineation and hydrologic model development.
- Use WMS to build hydrologic input data files for use with HEC-1 (HMS), TR-20, TR-55, regional regression equations, and Rational Method programs, including instruction on how to graphically view the output.

Target Audience:

Federal, State, and local hydrologic/hydraulic engineers who have responsibility for the design and analysis of highway stream crossings. In order to derive the most benefit from this training, course participants should have knowledge of the fundamentals of hydrology and hydrologic modeling. Experience with one of the aforementioned hydrologic modeling computer programs would be helpful.

Technical Information	Larry Arneson	(303) 716-2144 larry.arneson@fhwa.dot.gov
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Hydraulics

Course Number: 135081A

Course Title: Introduction to Highway Hydraulics Software

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 14; Maximum 20

This course requires computers with the following minimum configuration: 850 MHz Intel Pentium III Processor or equivalent with 128 MB RAM, 100 MB available disk space, CD-ROM drive, and Windows NT 4.0 with Service Pack 6a. NOTE: Maximum of two participants per terminal.

Description:

The course provides engineers and designers with hands-on computer experience in the selection and application of software tools commonly applied for highway hydraulics including estimating peak flows and hydrographs, as well as the analysis and design of storm drains, culverts, detention basins, and channels. The Watershed Modeling System (WMS) will be the Windows interface used for most applications. Software covered in the course includes:

- NFF (National Flood Frequency) Program
- SCS TR-55
- HEC-1/HEC-HMS
- FHWA Storm Drain for design of pipes and inlets.
- HY8 for culvert and energy dissipator analysis and design.
- WMS detention basin and channel calculators for detention basin and channel design.

Outcomes:

Upon completion of the course, participants will be able to:

- Define a drainage outlet and delineate a watershed using WMS.
- Compute peak flows using NFF and TR-55.
- Perform normal depth and stability calculations using the WMS channel calculator.
- Design a culvert using HY8 and the HY8 input generator.
- Select and size an energy dissipator using the HY8 energy dissipator software.
- Design and analyze storm drain inlets and pipes using WMS and the FHWA storm drain program.
- Route a hydrograph through a detention basin using the WMS detention basin calculator.

Target Audience:

Highway engineers and designers responsible for the hydrologic and hydraulic aspects of designing storm drains, culverts, detention basins, and channels. Attendees should have a basic knowledge of hydrology and hydraulics. The course will briefly review theory, but will focus on hands-on problems.

Technical Information	Joseph Krolak	(410) 962-0091 joseph.krolak@fhwa.dot.gov
NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Intelligent Transportation Systems (ITS)

Course Number: 137001A

Course Title: ITS Awareness Seminar

Fee: \$200 Per Participant **Length:** 1 Day (CEU: 0.6 Unit) **Class Size:** Minimum 20; Maximum 30

This course is also available as a Web-based course at the Consortium for ITS Training and Education (CITE) located at: <http://www.citeconsortium.org/registration.html>.

Description:

This course provides an overall understanding of Intelligent Transportation Systems (ITS) and the ITS infrastructure. The course illustrates the ITS infrastructure components by showcasing those systems that are deployed around the country and discussing multi-modal systems that will benefit from the use of the ITS infrastructure. Institutional and technical issues involved in deploying ITS infrastructure are also presented. Topics covered include: planning, design, architecture, standards, procurement, installation and construction, operation and maintenance, and funding of ITS systems. The benefits associated with various types of ITS deployment are presented and explained.

The one-hour executive summary developed for elected and appointed officials may be requested through the National Resource Center, or a FHWA Division office. Questions concerning this offering should be addressed to the Technical Information point of contact.

Outcomes:

Upon completion of the course, participants will be able to:

- Define ITS by discussing the elements, functions, and benefits of ITS.
- Identify essential stakeholders and the need for interaction between them.
- Explain the importance of integrating systems throughout a region.
- Compare and contrast two case studies of ITS deployments.
- Identify information resources, such as Websites, other training, or data libraries, for more information on ITS.

Target Audience:

This course is intended for traffic engineers, State, Federal and local transportation planners, Metropolitan Planning Organizations (MPOs), transit and highway operators, public safety responders (enforcement, fire, EMS, towing, public works), Transportation Management Center (TMC) specialists, motor carrier managers, environmental groups, IT personnel, college and university faculty and students, consultants and contractors. Other groups belong in the audience as well, namely on the “technical/professional” side: ITS (and even non-traditional ITS) vendors, practitioners in ITS-related fields, such as those in financial, marketing, media and others who are increasingly valued ITS partners. Executives and managers, elected officials, and the general public will be served well by the Executive Summary specified in the Course Description.

Technical Information	Ron Giguere	(202) 366-2203 ron.giguere@fhwa.dot.gov
NHI Training Program Manager	Larry Jones	(703) 235-0523 larry.jones@fhwa.dot.gov

Intelligent Transportation Systems (ITS)

Course Number: 137002A

Course Title: Deploying Integrated ITS - Metropolitan

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course is part of the core Intelligent Transportation Systems (ITS) curriculum established by the ITS Professional Capacity Building (PCB) program. For more information on the core curriculum, go to URL: www.pcb.its.dot.gov/Catalogs/ITSCurriculum.htm#section2.

This course supports integrated intelligent transportation system infrastructure deployment with consideration of the National ITS Architecture. The regional context in which the public components of ITS infrastructure will be implemented and integrated is emphasized. The course combines the technical and institutional components of integrated ITS infrastructure. The importance of each component is discussed and placed in context with the regional decision that must be made by State and local agencies. Transportation program managers will obtain an understanding of the technical and institutional implications for deploying integrated infrastructure within the framework of a regional architecture.

Outcomes:

Upon completion of the course, participants will be able to:

- Identify the needs that can be addressed by ITS strategies.
- Select the best practices for planning and programming integrated ITS in a metropolitan area.
- Relate the need for a Regional Architecture and use of Standards to ensure integrated ITS deployment.
- Select the best practices for ITS project planning, design, construction, and implementation.
- Explain the Systems Engineering approach to ITS project implementation.
- Describe the use of a "concept of operations" to plan for integrated systems.
- Identify typical costs and benefits of different types of ITS deployments.

Target Audience:

This course is intended for state agencies, Metropolitan Planning Organizations (MPOs), city/local/county transportation professionals who implement ITS deployment schedules as part of the planning process, deal with public safety, plan for highway and transit; ITS specialists who provide information or recommendations in operations; and those who fulfill regulations (oversight), manage ITS or operations providers, coordinate projects and programs, review specifications, develop regulations and specifications, and design systems; engineers; Regional Architecture developers; systems integrators; and private sector people associated with these tasks.

ITS	Ron Giguere	(202) 366-2203 ron.giguere@fhwa.dot.gov
Technical Information	Barry Zimmer	(202) 366-4082 barry.zimmer@fhwa.dot.gov
NHI Training Program Manager	Bud Cribbs	(703) 235-0526 bud.cribbs@fhwa.dot.gov

Intelligent Transportation Systems (ITS)

Course Number: 137003A

Course Title: ITS Public/Private Partnerships

Fee: \$200 Per Participant **Length:** 1 Day (CEU: 0.6 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course is part of the core Intelligent Transportation Systems (ITS) curriculum established by the ITS Professional Capacity Building (PCB) program. For more information on the core curriculum, go to URL: <http://www.pcb.its.dot.gov/Catalogs/ITSCurriculum.htm#section2>.

This course describes various types of cooperative public/private partnerships. It presents public/private partnership models for cost sharing, shared deployment, and franchising. It also identifies institutional impediments, discusses sharing in ITS partnering, and presents successful case studies.

Outcomes:

Upon completion of the course, participants will be able to:

- Describe functions/roles required to deploy ITS.
- Identify ITS infrastructure components where private resources effectively contribute.
- Recognize private sector motives/interests.
- Identify potential partnership opportunities at project level.
- Describe program strategies for private sector involvement.
- Anticipate key partnership issues and choose the best type of partnership to meet the needs of the region.

Target Audience:

Transportation program managers currently involved in ITS or expected to be involved in ITS planning, implementation, operation, or maintenance.

Technical Information	Robert Rupert	(202) 366-2194 robert.rupert@fhwa.dot.gov
NHI Training Program Manager	Bud Cribbs	(703) 235-0526 bud.cribbs@fhwa.dot.gov

Intelligent Transportation Systems (ITS)

Course Number: 137005A

Course Title: ITS Telecommunications Overview

Fee: \$200 Per Participant **Length** 1 Day (CEU: 0.6 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course is part of the core Intelligent Transportation Systems (ITS) curriculum established by the ITS Professional Capacity Building (PCB) program. For more information on the core curriculum, go to URL: www.pcb.its.dot.gov/Catalogs/ITSCurriculum.htm#section2.

This course provides a broad introduction to telecommunications technologies, the associated issues and practical lessons-learned in the applications for such technologies of ITS.

Outcomes:

Upon completion of the course, participants will be able to:

- Recognize and deal with the current issues associated with the deployment and application of telecommunications infrastructure within the context of transportation project development, design, operations and management.
- Plan and conduct a requirements analysis to match devices and components to telecommunications technologies.
- Make use of regional ITS architectures for telecommunications planning.
- Explain the fundamentals of telecommunications at a basic level.
- Define some of the key terminology and concepts used in transportation telecommunications.
- Generalize a frame of reference to help in identifying and defining the institutional and organizational issues associated with the effective use of telecommunications technology in an advanced transportation context.

Target Audience:

Public and private-sector transportation professionals (project planners, engineers, managers and senior technicians) involved in ITS transportation planning and ITS deployment, such as MPO's transit agencies, municipalities, State highway agencies, FHWA Division and Resource Center offices, FTA personnel, and systems integrators.

Technical Information	William S. Jones	(202) 366-2128 william.jones@fhwa.dot.gov
NHI Training Program Manager	Bud Cribbs	(703) 235-0526 bud.cribbs@fhwa.dot.gov

Intelligent Transportation Systems (ITS)

Course Number: 137007A

Course Title: Rural ITS Toolbox

Fee: \$200 Per Participant **Length:** 1 Day (CEU: 0.6 Unit) **Class Size:** Minimum 20; Maximum 30

Description:

This course is part of the core Intelligent Transportation Systems (ITS) curriculum established by the ITS Professional Capacity Building (PCB) program. For more information on the core curriculum, go to URL: www.pcb.its.dot.gov/Catalogs/ITSCurriculum.htm#section2.

This course describes many ITS related practices and techniques that have been successfully applied to rural transportation problems. These successes are documented in the Rural ITS Toolbox. The training goes further into what is provided in the Toolbox, including problem solving techniques and training for the participant to describe the Toolbox contents to their stakeholders. The Rural ITS Toolbox training will be helpful to identify ITS solutions that can have a low-cost/high-return impact on rural transportation.

Outcomes:

Upon completion of the course, participants will be able to:

- Define ITS by discussing the elements and functions of ITS.
- Comprehend the value of the Rural ITS Toolbox for articulating rural ITS deployment strategies.
- Discuss local examples of regional ITS projects.
- Explain the benefits of rural ITS.
- Recognize the need to identify stakeholders and the importance of fostering interaction among them.
- Identify information resources, such as Web sites, other training, data libraries, etc. for more information on ITS.
- Tailor portions of the rural ITS Toolbox for presentation/discussion with other rural stakeholders so that they recognize their roles in rural ITS deployment.

Target Audience:

County, municipal and town executives; traffic engineers; State, Federal and local transportation planners; MPOs' transit and highway operators; public safety responders (enforcement, fire, EMS, towing, public works); Transportation Management Center (TMC) operators; motor carrier managers; environmental groups; IT personnel; college and university faculty and students, and consultants.

Technical Information	James Pol	(202) 366-4374 james.pol@fhwa.dot.gov
NHI Training Program Manager	Bud Cribbs	(703) 235-0526 bud.cribbs@fhwa.dot.gov

Intelligent Transportation Systems (ITS)

Course Number: 137013A

Course Title: Deploying the National Intelligent Transportation System (ITS) Architecture

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course is part of the core Intelligent Transportation Systems (ITS) curriculum established by the ITS Professional Capacity Building (PCB) program. For more information on the core curriculum, go to URL: <http://www.pcb.its.dot.gov/Catalogs/ITSCurriculum.htm#section2>.

This course is designed to be an interactive workshop to demonstrate how to apply the National ITS Architecture tools and methodologies when developing regional and project ITS architecture. A copy of the National ITS Architecture 4.0 is provided on CD-ROM for course use and student retention.

Outcomes:

Upon completion of the course, participants will be able to:

- Use the National ITS Architecture as a tool when developing regional and project ITS architectures.
- Identify integration opportunities while developing regional and project ITS architectures.
- Use the National ITS Architecture CD-ROM to find definitions.
- Identify the difference between user service and user service requirements, and describe how these relate to the National ITS Architecture.
- Identify the difference between user service and user service requirements, and describe how these relate to the National ITS Architecture.
- ITS Architecture and Standards, and describe the key requirement for compliance.
- Define the systems engineering process, as it is used with the National ITS Architecture.

Target Audience:

Public sector audiences, who are involved in ITS planning and deployment, as well as systems integrators and private sector transportation professionals who develop ITS solutions.

Technical Information	Pam Kordenbrock	(202) 366-2199 pamela.kordenbrock@fhwa.dot.gov
NHI Training Program Manager	Bud Cribbs	(703) 235-0526 bud.cribbs@fhwa.dot.gov

Intelligent Transportation Systems (ITS)

Course Number: 137015C

Course Title: Introduction to National ITS Architecture

Fee: \$100 Per Participant **Length:** 6 Hours **Class Size:** N/A

This web-based course is approximately 6 hours, and is available anytime - 24 hours, 365 days a year via the Internet. This course is available at the Consortium for ITS Training and Education (CITE) located at: <http://www.citeconsortium.org/registration.html>. Please go to the CITE Website to register for the course.

Description:

The course is intended to provide students with a broad overview of the National ITS Architecture and the role it plays in ITS planning, designing and implementation processes. It provides some background (what the National ITS Architecture consists of, how it is defined, why it was established, and what its aims and objectives are), and introduces the notion of User Service. The physical architecture is explained using examples of local implementations of the national ITS Architecture. Specific elements of the physical architecture, such as subsystems and terminators, are presented in some detail.

Outcomes:

Upon completion of the course, participants will be able to:

- Define the systems engineering process, as it is used with the National ITS Architecture.
- Develop an understanding of the context within which the Architecture is to be applied to the ITS planning, design and implementation process.
- Disseminate updated information on the evolving standards and protocols being developed to support the architecture.
- Recognize the content and procedures associated with the National Architecture.

Target Audience:

Public sector audiences who are involved in ITS planning and deployment, as well as systems integrators and private sector transportation professionals who develop ITS solutions.

Technical Information	Ron Giguere	(202) 366-2203 ron.giguere@fhwa.dot.gov
WWW Assistance	Rick DeLeyos	(301) 403-4593 rdeleyos@wam.umd.edu
NHI Training Program Manager	Bud Cribbs	(703) 235-0526 bud.cribbs@fhwa.dot.gov

Intelligent Transportation Systems (ITS)

Course Number: 137019A

Course Title: ITS Software Acquisition

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course is part of the core Intelligent Transportation Systems (ITS) curriculum established by the ITS Professional Capacity Building (PCB) program. For more information on the core curriculum, go to URL: www.pcb.its.dot.gov/Catalogs/ITSCurriculum.htm#section2.

This course provides a general understanding of the many issues involved in ITS software development and acquisition processes. It is focused specifically on ITS software issues. It is a companion course to NHI Course No. 137020 - ITS Procurement.

Outcomes:

Upon completion of the course, participants will be able to:

- Describe the basic technologies used in software development.
- Describe the private sector view of software development.
- Describe the intellectual property rights and how they must be considered.
- Manage the procurement of ITS software.
- Write a Request for Proposal for software procurement.
- Describe quality assurance issues.

Target Audience:

Federal, State and local transportation professionals who are involved in the planning, decision-making and implementation of ITS projects which have a significant software component, or who are involved in coordinating these ITS projects.

Technical Information	William S. Jones	(202) 366-2128 william.jones@fhwa.dot.gov
NHI Training Program Manager	Bud Cribbs	(703) 235-0526 bud.cribbs@fhwa.dot.gov

Intelligent Transportation Systems (ITS)

Course Number: 137020A

Course Title: Intelligent Transportation System (ITS) Procurement

Fee: \$200 Per Participant **Length:** 1 Day (CEU: 0.6 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course is part of the core Intelligent Transportation Systems (ITS) curriculum established by the ITS Professional Capacity Building (PCB) program. For more information on the core curriculum, go to URL: www.pcb.its.dot.gov/Catalogs/ITSCurriculum.htm#section2.

Deployment of ITS introduces new challenges to State and local transportation agencies that operate under traditional procurement practices developed to support the design and construction of roads and bridges or to design and construct rail projects. The traditional practices do not readily accommodate the special needs of ITS procurement which is focused on operations. For this reason, the transportation professional must recognize the special considerations required in ITS procurements, and understand how they can be accommodated. This seminar is intended to heighten awareness of the challenges in procuring ITS within the traditional construction project environment. It combines lectures with presentations of case studies to describe the lessons learned from past ITS projects and to help ensure successful ITS procurement. This seminar is a companion to, but not a prerequisite for NHI Course No 137019A - ITS Software Acquisition.

Outcomes:

Upon completion of the course, participants will be able to:

- Describe the nature of Intelligent Transportation Systems and explain why procuring intelligent transportation systems is different from traditional construction procurements.
- Describe the potential barriers that may arise from procuring intelligent transportation systems within the traditional construction oriented environment.
- Describe lessons learned from previous ITS projects.
- Apply innovative contracting mechanisms and flexibilities in existing regulations to mitigate barriers.
- Apply lessons learned to existing policies and procedures to achieve improvements in procuring intelligent transportation systems.

Target Audience:

Federal, State, and local transportation professionals who are directly involved in procuring ITS systems. Specifically, those personnel who are responsible for developing and reviewing statements of work for ITS procurement, including program managers, contracting officers, and attorneys.

Technical Information	William S. Jones	(202) 366-2128 william.jones@fhwa.dot.gov
NHI Training Program Manager	Bud Cribbs	(703) 235-0526 bud.cribbs@fhwa.dot.gov

Intelligent Transportation Systems (ITS)

Course Number: 137022A

Course Title: CORSIM Traffic Simulation Model Training

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 30
The hosting organization is responsible for providing computers with the following minimum requirements: 200 MHz Intel Pentium® II Processor or equivalent with 64 MB RAM, Windows 95 (SR-1) or NT 4.0 with Service Pack 6a, color monitors, 50 MB of available disk space. NOTE: Maximum of two participants per terminal.

Description:

This course provides an understanding of CORSIM - a tool that simulates traffic and traffic control conditions on combined surface street and freeway networks. CORSIM determines how traffic engineering and control strategies impact a prescribed network's operational performance, as expressed in terms of various Measures of Effectiveness (MOEs). The MOEs (such as speed, travel time, volume, and delay) provide insights into the effects of the applied strategy on traffic operations and provide the basis for optimizing the applied strategy. CORSIM, the simulation package within the Traffic Software Integrated System (TSIS) suite of tools, is a powerful tool that can be applied to

- 1) Practical traffic engineering activities such as signal retiming, traffic impact studies, analysis of major traffic events, stadium operations, corridor traffic operations, and freeway incident impacts.
- 2) Evaluating ITS technologies, such as real time traffic adaptive control, real time traveler information and route guidance, and network-wide dynamic traffic assignment.

Outcomes:

Upon completion of the course, participants will be able to:

- Describe CORSIM features (including advantages and disadvantages).
- Determine appropriate uses for CORSIM.
- Identify types and sources of data.
- Given real-world data, prepare a link-node diagram, then code for input to CORSIM.
- Input data, run CORSIM, and interpret output for arterial, freeway, and combined networks.
- Identify circumstances and procedures for calibrating models.
- Interpret and fix common error messages.
- Use CORSIM to simulate traffic improvements.

Target Audience:

Traffic engineers in the public and private sectors, as well as in academia, who are involved in ITS planning and deployment.

Technical Information	John Halkias	(202) 366-2183 john.halkias@fhwa.dot.gov
NHI Training Program Manager	Bud Cribbs	(703) 235-0526 bud.cribbs@fhwa.dot.gov

Intelligent Transportation Systems (ITS)

Course Number: 137024A

Course Title: Introduction to Systems Engineering for Advanced Transportation

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course is part of the core Intelligent Transportation Systems (ITS) curriculum established by the ITS Professional Capacity Building (PCB) program. For more information on the core curriculum, go to URL: www.pcb.its.dot.gov/Catalogs/ITSCurriculum.htm#section2.

This course is an introduction to systems engineering for ITS project managers and project staff. It provides a high-level view of a broad and rich topic area, introducing basic concepts to individuals who are working on ITS projects. The goal is to allow these individuals to understand the benefits of applying systems engineering approaches as a means of developing quality systems. The course covers technical practices such as modeling, prototyping, trade-off analysis and testing, and management practices such as risk assessment and mitigation, which make up “best practices” in the systems engineering arena. A combination of lecture and classroom exercises, with transportation systems examples, is used to illustrate the basic concepts and to introduce the topics to students.

Outcomes:

Upon completion of the course, participants will be able to:

- Define Systems Engineering and its application to ITS.
- Describe the system's life cycle and its relationship to systems engineering.
- Develop, derive, and validate requirements for a system.
- List the systems engineering tools available to mitigate risk.
- Define and apply the concept of earned value as a tracking mechanism.
- List three alternative strategies that may be applied to decision-making under uncertainty.
- Identify where to find appropriate standards for developing ITS projects.
- Identify resources that may help project personnel to look at systems as a whole.

Target Audience:

Transportation engineers and other practicing ITS professionals or technical persons at all levels of government and in the private sector. ITS project managers, technical team members, contractors, and staff are all appropriate participants. Project managers would particularly benefit from this course because they direct many peoples' efforts. Any level of professionals involved in ITS may attend to broaden their understanding of complex systems, beyond current technical knowledge.

Technical Information	Ron Giguere	(202) 366-2203 ron.giguere@fhwa.dot.gov
NHI Training Program Manager	Bud Cribbs	(703) 235-0526 bud.cribbs@fhwa.dot.gov

Intelligent Transportation Systems (ITS)

Course Number: 137026A

Course Title: Managing High Technology Projects in Transportation

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

This course is also available as a Web-based course at the Consortium for ITS Training and Education (CITE) located at: <http://www.citeconsortium.org/registration.html>.

Description:

This course is part of the core Intelligent Transportation Systems (ITS) curriculum established by the ITS Professional Capacity Building (PCB) program. For more information on the core curriculum, go to URL: www.pcb.its.dot.gov/Catalogs/ITSCurriculum.htm#section2.

The course is designed to improve project management skills of both public and private sector personnel who are responsible for managing the implementation of technology-intensive transportation projects. The course provides training related to: the fundamental principles and practices of good project management; the steps to be taken for the planning, design and implementation of transportation systems projects; the types of project management tools available for managing transportation systems projects; and the basic skills required to be a good project manager. This course covers project management techniques associated with all phases of system acquisition, from planning through acceptance. The skills required for the ongoing operation and maintenance of systems that are somewhat different are not explicitly covered in this course.

Outcomes:

Upon completion of the course, participants will be able to:

- Describe why tailored project management techniques are critical to success in managing advanced transportation projects.
- Define key components in planning the project.
- Identify the primary participants that need to be involved throughout the development of a project.
- Identify the stages of the process and the management tools that are applicable at each stage.
- Identify and describe key general management skills that are applicable to managing projects for advanced transportation systems.

Target Audience:

Current and prospective project managers from State DOTs and State and local transportation agencies, as well as those in the private sector who support the implementation of advanced transportation projects.

Technical Information	Pam Kordenbrock	(202) 366-2199 pamela.kordenbrock@fhwa.dot.gov
NHI Training Program Manager	Bud Cribbs	(703) 235-0526 bud.cribbs@fhwa.dot.gov

Intelligent Transportation Systems (ITS)

Course Number: 137029A

Course Title: Turbo Architecture Software Training

Fee: \$270 **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

Newly updated course content. The hosting organization is responsible for providing computers with the following minimum requirements: at least 400MHz CPU, 64 MB of RAM, 150MB hard-disk space available, external mouse, CD-ROM drive, and Diskette Drive (1.44MB); Windows 98SE, 2000, or XP; and Workstation monitors configured for 1024x768 resolution. NOTE: Maximum of two participants per terminal.

Description:

This course provides training on the Turbo Architecture tool, which is a high-level, interactive software training program to assist transportation planners and systems integrators in the development of regional and project architectures using the National Intelligent Transportation Systems (ITS) Architecture as a starting point. Turbo Architecture helps users integrate multiple project architectures both with each other and with a regional architecture. In addition, Turbo Architecture provides an initial start toward both architecture development and consistency with the National ITS Architecture.

PREREQUISITES:

- 1) Windows skills-The ability to traverse directories, open/close/resize/minimize windows, switch between open windows, and launch and navigate browser.
- 2) ITS knowledge-Knowledge of common ITS concepts and terminology.
- 3) Architecture knowledge-The ability to translate all ITS elements in their region into architecture entities (subsystems, terminators, architecture flows), and to translate their region's transportation services into market packages.
- 4) National ITS Architecture CD-ROM skills-Proficiency in using the Architecture CD to find information on subsystems, terminators, architecture flows and market packages.

Outcomes:

Upon completion of the course, participants will be able to:

- List the preparatory decisions and assembly of information needed to create a Regional Architecture or a Project Architecture.
- Describe the six steps in the process used by Turbo Architecture to create a Regional Architecture or Project Architecture.
- Use Turbo Architecture software to create and modify a simple Regional Architecture or Project Architecture, including: entering inventory data, selecting Market Packages, reconciling inventory inconsistencies, building the architecture, customizing interconnects and architecture flows, and printing reports and diagrams.
- Merge a Project Architecture with a Regional Architecture database.
- Describe in general terms how to extend the Regional or Project Architecture by adding architecture flows, subsystems and terminators beyond those defined by the National ITS Architecture.

Target Audience:

State DOT and local-agency staff from Metropolitan Planning Organizations (MPOs) and city/county transportation agencies, as well as private sector consultants, who are developing Regional and Project Architectures. Their responsibility to assemble ITS inventory data for their region or for their project, and to use Turbo to build and customize their regional or project architecture.

Technical Information	Robert Rupert	(202) 366-2194 robert.rupert@fhwa.dot.gov
NHI Training Program Manager	Bud Cribbs	(703) 235-0526 bud.cribbs@fhwa.dot.gov

Intelligent Transportation Systems (ITS)

Course Number: 137041A

Course Title: ITS Deployment Analysis System (IDAS)

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 24

The hosting organization is responsible for providing computers with the following minimum requirements: 500 MHz Intel Pentium. II Processor or equivalent with 128 MB of RAM, Windows NT 4.0 with Service Pack 6a, color monitors, 2 GB of available disk space. NOTE - Maximum of two participants per terminal.

Description:

This course is a hands-on computer training session on the newly developed ITS Deployment Analysis System (IDAS) software. IDAS provides ITS sketch planning capability to calculate the relative costs and benefits of ITS investments. IDAS incorporates a cost module, a benefit module and an internal travel demand model to generate cost/benefit comparisons for alternative ITS deployment scenarios. IDAS uses the output from an existing transportation planning model to establish a best case scenario on which the user can deploy ITS services on specific links in the regional transportation network model.

Outcomes:

Upon completion of the course, participants will be able to:

- Discuss integrating ITS in the transportation planning process.
- Explain the relationship between travel demand models and IDAS.
- Successfully apply IDAS Input/Output module, Alternatives Generator, Benefits module, Cost module, and Alternatives Comparison module.
- Review, interpret and refine IDAS defaults.
- Interpret IDAS results in terms of impacts and traveler responses to ITS.
- Interpret IDAS results in terms of ITS benefits and costs.
- Conduct sensitivity and risk analysis.

Target Audience:

FHWA, State DOT, Metropolitan Planning Organization and local government transportation planning staff. ITS program managers and specialists would benefit as well.

Technical Information	Ron Giguere	(202) 366-2203 ron.giguere@fhwa.dot.gov
NHI Training Program Manager	Bud Cribbs	(703) 235-0526 bud.cribbs@fhwa.dot.gov

Freight and Transportation Logistics

Course Number: 139001A

Course Title: Integrating Freight in the Transportation Planning Process

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

Description:

Freight transportation issues can be complex and involve many different stakeholders, all of whom have different perspectives on how they view the freight transportation system. The challenge faced by many public sector transportation planners is how to best incorporate these freight issues and perspectives into the transportation planning process, which will result in a safe and efficient transportation system for both people and goods. This course will provide a better understanding of freight transportation, its stakeholders, and its issues so that public sector transportation planners will be better able to incorporate freight into their respective transportation planning processes and programs.

Outcomes:

Upon completion of the course, participants will be able to:

- Identify the stakeholders involved in freight transportation.
- Explain the role of different modes in freight transportation.
- Describe some trends affecting freight transportation, and their impact on a State's transportation system and communities.
- Discuss some of the common issues that prevent freight from being fully incorporated in the planning process.
- Identify key resources to help guide statewide and metropolitan freight planning efforts.

Target Audience:

Transportation planners and freight transportation planners from State DOTs, MPOs, local governments and Federal agencies.

National Resource Center	Fawn Thompson	(404) 562-3917 fawn.thompson@fhwa.dot.gov
Technical Information	Eloise Freeman-Powell	(202) 366-2068 eloise.freeman-powell@fhwa.dot.gov
	Scott Johnson	(202) 366-9498 scott.johnson@fhwa.dot.gov
NHI Training Program Manager	Bud Cribbs	(703) 235-0526 bud.cribbs@fhwa.dot.gov

Freight and Transportation Logistics

Course Number: 139002A

Course Title: Freight Forecasting in Transportation Planning

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 30

First 10 course presentations are free. After that, the course will be \$400 per participant. For your information, a more technical, "how to" type of workshop on freight forecasting is planned for development and delivery in FY 05.

Description:

This course is an "about" course on freight forecasting and describes different forecasting techniques for facility-specific, metropolitan and statewide needs. The course will identify freight planning questions that are commonly addressed by Transportation Planners, demonstrate the use and value of different freight forecasting techniques to answer those questions, and review Notable Practices on freight forecasting techniques used by metropolitan and state transportation agencies. It also provides the participant with a basic understanding of freight transportation practices, the key parameters that influence growth and distribution of freight traffic, and currently available tools and data to forecast future freight traffic.

Outcomes:

Upon completion of the course, participants will be able to:

- Explain why freight forecasting is important in the transportation planning process.
- Discuss the roles of different freight transportation modes.
- Describe the economic trends that influence freight growth.
- Describe the role of intermodal terminals and their impacts on local traffic.
- Identify the impacts that freight has on travel demand forecasts.
- Identify public and privately available sources of key freight data and understand the data sources' strengths and limitations as they relate to freight forecasting and planning.

Target Audience:

State and Metropolitan Planning Organization (MPO) officials who are involved in transportation planning and/or forecasting; staff of State and local agencies, including DOTs, MPOs, Port Authorities, and local jurisdictions, who are involved in the development and management of freight projects and plans; and staff of Federal agencies, including FHWA, FRA, FAA and other modal agencies that assist State and local agencies involved in transportation and/or freight planning and funding.

HQ	Bruce Spear	(202) 366-8870 bruce.spear@fhwa.dot.gov
NRC	Supin Yoder	(708) 283-3554 supin.yoder@fhwa.dot.gov
Technical Information	Bob Gorman	(202) 366-5001 bob.gorman@fhwa.dot.gov
NHI Training Program Manager	Bud Cribbs	(703) 235-0526 bud.cribbs@fhwa.dot.gov

Real Estate

Course Number: 141029A

Course Title: Basic Relocation

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 30

Description:

The course is designed for the beginning relocation agent or for those persons interested in a basic knowledge of the Uniform Relocation Assistance and Real Property Acquisition Act of 1970 (Uniform Act). The purpose is to answer questions, meet technical needs, and broaden the knowledge of those engaged in the relocation of persons as a result of the acquisition of real property required for a Federal or Federally-funded project. The course covers all functional areas of the relocation assistance program, with emphasis on residential displacements.

Outcomes:

Upon completion of the course, participants will be able to:

- Explain the principles that govern provisions of the Uniform Act and implementing regulations.
- Provide advisory services within his/her area of expertise.
- Identify services available from other agencies.
- Explain requirements for comparability to include decent, safe and sanitary housing.
- Compute moving costs and replacement housing payments.
- Explain the basic concept of last resort housing.
- Explain the appeal procedures for those displaced.

Target Audience:

Federal, State, and local public agencies; FHWA personnel, and other interested persons.

Technical Information	Mamie Smith	(202) 366-2529 mamie.smith@fhwa.dot.gov
NHI Training Program Manager	Mila Plosky	(703) 235-0527 mila.plosky@fhwa.dot.gov

Real Estate

Course Number: 141030A

Course Title: Advanced Relocation

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 30

Prerequisites: Basic Relocation Course - 141029A and WebCourse: Real Estate Acquisition Under the Uniform Act: An Overview - 141045C

Description:

This course will go beyond the basic functional areas of relocation assistance and concentrate on areas of specific concern, such as: comparability, mortgage interest differential payments, last resort housing, multiple use, tenants, farms, and non-residential moves—including businesses. The course has been modularized to allow flexibility in adjusting the subject material to meet the needs of the requesting agency.

Outcomes:

Upon completion of the course, participants will be able to:

- Explain the principles that govern relocation provisions of the Uniform Relocation Assistance and Real Property Acquisition Act of 1970 (Uniform Act) and implementing regulations.
- Identify factors involved in difficult relocation subject areas, such as mortgage interest differential payments, settlement costs, last resort housing, mobile homes, farms, and other non-residential moving payments.
- Describe issues that may arise when developing an advisory assistance plan for difficult relocation cases.
- Determine eligibility for certain relocation payments in difficult relocation cases.
- Calculate complex, non-residential moving costs.

Target Audience:

Federal, State, and local public agencies, FHWA personnel, and other interested persons. Broad knowledge of the requirements of the Uniform Act and the implementing regulations of 49 Code of Federal Regulation (CFR) Part 24; completion of NHI Course No. 141029 - Basic Relocation, or approximately one year of experience working in the relocation program is recommended.

Technical Information	Mamie Smith	(202) 366-2529 mamie.smith@fhwa.dot.gov
NHI Training Program Manager	Mila Plosky	(703) 235-0527 mila.plosky@fhwa.dot.gov

Course Number: 141031A

Course Title: Business Relocation

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course provides comprehensive information on the various aspects of business relocation and is designed to address the relocation of businesses, farms, and non-profit organizations. The main topics include: Eligibility; Moving Payments and Benefits; Advisory Services; Actual Direct Loss of Tangible Personal Property; Searching Expenses; Fixed Payments or in lieu of (ILO) payments; and Reestablishment Expense.

Outcomes:

Upon completion of the course, participants will be able to:

- Explain the factors involved in difficult subject areas, such as move cost estimating, farms, non-profit organizations, fixed or ILO payments, and re-establishment payments.
- Provide directly or assist others in providing advisory assistance in relocating businesses, farms, and non-profit organizations.
- Identify the sources and assembling of moving cost data including inventories, specifications, profit and loss relationships, bids and estimates.

Target Audience:

State departments of transportation, local public agencies, FHWA personnel, and other Federal agency personnel. Participants must have a basic knowledge of the relocation program.

Technical Information	Mamie Smith	(202) 366-2529 mamie.smith@fhwa.dot.gov
NHI Training Program Manager	Mila Plosky	(703) 235-0527 mila.plosky@fhwa.dot.gov

Real Estate

Course Number: 141036A

Course Title: Eminent Domain Training for Attorneys and Appraisers

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 35

Description:

This course is designed to enhance the performance of attorneys, appraisers, and other expert witnesses in the delivery and presentation of testimony and arguments in the courtroom setting to obtain realistic court awards in eminent domain proceedings. It is designed to illustrate the importance of, and how to develop, a team approach for effective presentation in condemnation actions. The course presentation includes lectures with the use of visual aids, handouts, and interactive case studies. Each participant will receive a course manual that should serve as a valuable reference tool.

Outcomes:

Upon completion of the course, participants will be able to:

- Identify valuation techniques, methodology, and practices associated with estimating fair market value and just compensation.
- Describe the legal framework of eminent domain actions necessary to perform effectively as attorneys and expert witnesses.
- Describe the basis for a proposed stipulated settlement, including the respective role of the appraiser and attorney in the consummation of such a settlement, including documentation.
- Recognize the extent to which the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act), as amended, and implementing state legislation applies to potential settlements including the relationship of 49 Code of Federal Regulation (CFR) Part 24 to settlements.
- Recognize what constitutes acceptable valuation technique and the approaches used by the appraiser to fully document appraisal estimates for condemnation purposes based on applicable state law.
- Document a report of the trial.
- Formulate a theory of a case that will be acceptable to the jury, based on the facts of the case and the theory's compatibility with the trial team.

Target Audience:

State highway and transportation agency and fee or contract attorneys and appraisers, and other potential expert witnesses working for State highway and transportation agencies. Participants should have a basic knowledge of the Uniform Act, including the implementing regulations of 49 CFR Part 24. The course is intended for beginning government attorneys acting as legal counsel in condemnation trials, as well as beginning and intermediate level appraisers acting as expert witnesses.

Technical Information	Mamie Smith	(202) 366-2529 mamie.smith@fhwa.dot.gov
NHI Training Program Manager	Mila Plosky	(703) 235-0527 mila.plosky@fhwa.dot.gov

Real Estate

Course Number: 141045C

Course Title: Real Estate Acquisition Under the Uniform Act: An Overview

Fee: \$150 Per Participant **Length:** 6 Hours (CEU: 0.6 Unit) **Class Size:** N/A

Recommended System Specifications:

- 600 MHz Intel Pentium III processor or equivalent with a minimum of 128 MB RAM
- Windows 98 Second Edition, ME, NT, 2000, or XP
- Audio capability with speakers
- Microsoft Internet Explorer v6, Netscape v7, Mozilla v1.1 or higher with JavaApplet and ActiveX enabled
- Flash 5 or higher plug-in installed
- Minimum screen resolution 800x600, thousands of colors (16-bit) display settings properties
- DSL or faster connection strongly recommended (Audio/animations may be slow at dial-up modem speeds)

Description:

The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act) is the basis for Federally-funded real estate acquisition programs. The goal of this web-based course is to help participants recognize what they need to know when acquiring real estate for a Federally-funded project.

Outcomes:

Upon completion of the course, participants will be able to:

- Provide a basic overview of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act).
- Discuss the three key elements of the Uniform Act: Valuation/Appraisal, Acquisition and Relocation.
- Explain how to develop an estimate of just compensation through the use of the appraisal process or appraisal waiver procedure(s).
- Define the process through which real estate is acquired.
- Identify relocation benefits and services required by the Uniform Act.
- List places to obtain relevant resource documents/materials.

Target Audience:

Federal, state and local government employees and consultants who acquire real estate; who serve as program/project managers; who serve as grant administrators or grant recipients. This includes Acquisition and Relocation Agents, Appraisers, Realty Specialists, Attorneys, Engineers, Planners, etc. Participant must register on-line at www.nhi.fhwa.dot.gov/registerdl.asp. Participant information, billing address, and credit card information must be provided when registering on-line. Participants will have a userid and password sent to them via e-mail after authorization in order to log in to the course from the distance learning page on the CITE website at www.citeconsortium.org.

Technical Information	Mamie Smith	(202) 366-2529 mamie.smith@fhwa.dot.gov
NHI Training Program Manager	Mila Plosky	(703) 235-0527 mila.plosky@fhwa.dot.gov

Environment

Course Number: 142005A

Course Title: NEPA and Transportation Decision-Making

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 35

Description:

This course considers FHWA's policies and procedures for applying the National Environmental Policy Act (NEPA) to the project development and decision-making processes related to transportation facilities. The course examines the evolution of environmental policy and the integration of social, environmental and economic factors into the framework of laws, regulations, policies, and guidance that assist in achieving a decision on a transportation project that is in the best overall public interest.

The course emphasizes utilization of: the Council on Environmental Quality's and FHWA's regulations and guidance for implementing NEPA and Section 4(f) of the Department of Transportation Act; and initiatives for interagency coordination and streamlining the project development process including those provisions contained in TEA-21. Also emphasized are: public involvement; Title VI/Environmental Justice; FHWA's policy for mitigation and enhancement; and the role of transportation in achieving sustainable development.

Outcomes:

Upon completion of the course, participants will be able to:

- Use the NEPA principles and the NEPA umbrella concept in the development of transportation projects.
- Explain the roles and responsibilities of participants in the NEPA process.
- Employ a reasoned, collaborative process when developing and evaluating alternatives.
- Practice balancing an array of interests and values in making transportation decisions.
- List the milestones in transportation planning that link to NEPA project development process.
- Describe documentation requirements of NEPA process.
- Employ environmental streamlining concepts of leadership, stewardship, and conflict resolution in managing the NEPA process.

Target Audience:

FHWA, State DOT (including consultants acting on behalf of the State), Federal and State environmental resource agencies, local government and MPOs who participate in the transportation decision-making process. We strongly encourage the hosting organization to invite a mix of planning and environmental staff from these agencies.

Technical Information	Aung Gye	(202) 366-2167 aung.gye@fhwa.dot.gov
NHI Training information	Mila Plosky	(703) 235-0527 mila.plosky@fhwa.dot.gov

Environment

Course Number: 142005C

Course Title: NEPA and Transportation Decision-Making

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** N/A

This course was revised in May 2003.

Description:

This web-based course provides an overview of the FHWA National Environmental Policy Act (NEPA) Transportation Decision-making process and covers the basics of FHWA policy and procedures. It provides an overview of the environmental process including the integration of social, environmental and economic factors within the framework of existing laws, regulations, policies, and guidance for transportation project decisions. The course covers generally the requirements of NEPA as implemented by the Council on Environmental Quality's Regulations and FHWA's regulations and guidance for implementing. Separate lessons include alternatives and impact analysis, public involvement and interagency coordination, mitigation, and documentation.

Outcomes:

Upon completion of the course, participants will be able to:

- Relate the origin, evolution, and context of NEPA.
- Describe the intent, goals, and basic requirements of NEPA.
- Describe the NEPA umbrella concept in transportation decision-making.
- Identify the NEPA principles in the development of transportation projects.
- Explain the roles and responsibilities of the lead agency, applicant, and cooperating agencies in the NEPA process.
- List documentation requirements of the NEPA process.

Target Audience:

FHWA, State DOT (including consultants acting on behalf of the State), Federal and State environmental resource agencies, local government and MPOs who participate in the transportation decision-making process.

Technical Information	Aung Gye	(202) 366-2167 aung.gye@fhwa.dot.gov
NHI Training Program Manager	Mila Plosky	(703) 235-0527 mila.plosky@fhwa.dot.gov

Environment

Course Number: 142018A

Course Title: Functional Assessment of Wetlands

Fee: \$530 Per Participant **Length:** 4 Days (CEU: 2.4 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course provides an introduction to assessing wetlands impacts and mitigation planning based on Hydrogeomorphic principles of wetlands analysis. A brief overview of recent changes in wetland regulations is included. The course is comprised of both classroom and field exercises demonstrating the wetlands assessment and analysis techniques including wetland regulations, wetland ecology, and mitigation planning.

Outcomes:

Upon completion of the course, participants will be able to:

- Recognize requirements and basic principles for regulatory compliance, wetlands impact assessment and mitigation under National Environmental Policy Act of 1969 (NEPA) and Section 404, Clean Water Act, including the 404b(1) guidelines.
- Identify different wetland types and be familiar with common definitions, delineation requirements, and wetlands classification, including the U.S. Fish and Wildlife Service and Hydrogeomorphic (HGM) functional classifications.
- Describe the common ecological functions and values of wetlands.
- Identify principles, approaches, and policies for compensatory mitigation, including wetland banking and in lieu fee plans.
- Recognize the HGM Assessment methodology.
- Demonstrate functional assessments of wetlands for alternatives analysis and selection for impact assessment according to principles of HGM, Evaluation of Planned Wetlands (EPW), and Wetland Evaluation Techniques (WET).
- Apply HGM, WET, EPW methods to planning and development of wetland mitigation projects.

Target Audience:

State DOT personnel who have professional/technical responsibilities relating to managing wetlands and impacts in a transportation environment. Other Federal, State, local government and industry personnel with related responsibilities may be permitted to attend on a space available basis. A basic understanding of Federal regulations concerning wetlands will be helpful. In addition, participants need at least one of the following: (1) experience in the highway project development process; (2) experience in highway project planning and design; (3) experience in natural resources regulation and management; or (4) experience in ecological assessment and mitigation design.

Technical Information	Paul Garrett	(303) 969-5772 Ext. 332 paul.garrett@fhwa.dot.gov
NHI Training information	Mila Plosky	(703) 235-0527 mila.plosky@fhwa.dot.gov

Environment

Course Number: 142036A

Course Title: Public Involvement in the Transportation Decision-Making Process

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 30

Description:

Public involvement is about giving the public an opportunity to influence transportation decision making. The public should have a role in every phase of decision-making, including the design of the public involvement plan itself. Successful public involvement means addressing the public's procedural, psychological, and substantive needs. Focusing on interests, rather than positions, can make public involvement more meaningful and useful. Public involvement is much more than public hearings and involves creative thinking, the willingness and ability to interact openly, and sensitivity to the public's preferred forms of communication and participation.

Outcomes:

Upon completion of the course, participants will be able to:

- Identify key decision points where the public can/should be involved.
- Select and apply a variety of specific techniques to get information out to the public and elicit input from the public.
- Identify different publics and engage them through targeted techniques.
- Integrate the public-involvement process with the decision-making process.
- Develop public involvement plans.
- Conduct interviews and focus groups to get input on planning relevant public involvement activities.
- Choose to speak and listen in ways that will enhance openness and reduce resistance.
- Differentiate between positions and interests and ask questions that will elicit interests and lead toward problem solving.
- Distinguish between public relations and participatory decision-making.
- Track what is learned from the public and transfer that information to decision-makers.
- Identify and adapt to different cultural sensitivities.
- Define environmental justice, name the factors that are considered, and describe the public involvement implications of complying with environmental justice policy.

Target Audience:

Federal, State and local transportation agency staff, Metropolitan Planning Organization personnel, transit operators, consultants and others who are responsible for planning, implementing or participating in any phase of the public involvement process.

Technical Information	David Kuehn	(202) 366-6072 david.kuehn@fhwa.dot.gov
NHI Training Program Manager	Mila Plosky	(703) 235-0527 mila.plosky@fhwa.dot.gov

Environment

Course Number: 142042A

Course Title: Fundamentals of Title VI/Environmental Justice

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

Description:

Environmental Justice and Title VI apply to every stage of transportation programs. USDOT and its partners are committed to nondiscrimination in all Federal-aid programs. Many opportunities exist to establish partnerships with other public and private organizations to create more livable communities. This course presents a framework for using a variety of approaches and tools for accomplishing environmental justice goals.

Outcomes:

Upon completion of the course, participants will be able to:

- Define Environmental Justice and describe its relationship to Title VI of the Civil Rights Act of 1964.
- Explain the fundamental principles of Environmental Justice.
- Apply the principles of Environmental Justice to transportation decisions.
- Identify how Environmental Justice applies to every stage of transportation decision-making.
- Describe the benefits of Environmental Justice in transportation decision-making.
- Develop proactive strategies, methods and techniques to implement Environmental Justice in transportation programs and projects.

Target Audience:

Federal, State and local transportation agency transit or planning personnel (including consultants acting on their behalf) who interact with minority and low-income communities. State and local agency personnel providing community services. Elected officials and their representatives.

Technical Information	David Kuehn	(202) 366-6072 david.kuehn@fhwa.dot.gov
NHI Training Program Manager	Mila Plosky	(703) 235-0527 mila.plosky@fhwa.dot.gov

Environment

Course Number: 142043A

Course Title: The CMAQ Program: Purpose and Practice

Fee: \$270 The fee is waived for Federal Agency representatives. **Length:** 2 Days (CEU: 1.2 Units)

Class Size: Minimum 20; Maximum 30

This is a newly developed course in concert with EPA, the Department of Energy and the Federal Transit Administration.

Description:

This course provides an overview of the Congestion Mitigation and Air Quality Improvement (CMAQ) Program, a \$14 billion funding program dedicated to improving air quality in the country's nonattainment and maintenance areas. The course explains the underlying principles of the CMAQ program, including: how it fits within the overall Federal-aid Highway Program; the programs' objectives under Title 23 of the United States Code; and its relationship to the Clean Air Act and air quality planning. Finally, the course will describe eligibility for the CMAQ program, reporting requirements, and discuss how the program is being implemented across the country.

Outcomes:

Upon completion of the course, participants will be able to:

- Explain the underlying principles, including the genesis and background of the CMAQ program.
- Outline the roles and responsibilities of Federal, state and local agencies in implementing the CMAQ program.
- Explain how CMAQ funding levels are established at the Federal and state levels and how states distribute CMAQ funding throughout the state.
- Apply eligibility requirements.
- Describe CMAQ project selection procedures and methods, including: solicitation of proposals for CMAQ funding, project selection, and programming in the metropolitan and statewide Transportation Improvement Program (TIP).
- Describe CMAQ implementation requirements, including obligation of funds, reimbursement, the need for matching funds, reporting of estimated emissions benefits and evaluation.

Target Audience:

Staff from State and local transportation agencies; state and local air quality agencies; metropolitan planning organizations; FHWA, FTA, EPA and DOE Clean Cities coordinators; potential project sponsors from the public and private sectors; and consultants working in transportation/air quality.

Technical Information	Michael Koontz	(202) 366-2076 michael.koontz@fhwa.dot.gov
NHI Training Program Manager	Mila Plosky	(703) 235-0527 mila.plosky@fhwa.dot.gov

Environment

Course Number: 142044A

Course Title: Implications of Air Quality Planning for Transportation

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 30

Description:

The Clean Air Act Amendments (CAAA) of 1990, the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), and the Transportation Equity Act for the 21st Century (TEA-21) reinforced the close linkage between clean air goals and transportation investments. These statutes also specify requirements that apply to transportation and air quality agencies throughout the United States. However, after more than ten years of implementation, it is clear that more educational opportunities are needed to explain how clean air and transportation rules and regulations interrelate. This course was developed to provide this linkage. The course goes beyond the statutes to explain how the integrated transportation and air quality planning process has been defined and reinforced over the past decade by regulations, guidance, and litigation. It provides a context for the various statutory and regulatory requirements, including a comprehensive review of the 1990 CAAA requirements, Environmental Protection Agency (EPA) policies related to transportation, and the process of developing State Implementation Plans (SIPs). It also provides information on emission trends, forecasting techniques, technology improvements, emerging issues, and demonstrates how transportation planning and air quality planning fit together under the Transportation Conformity Rule. Finally, it includes hands-on information based upon practitioners' experiences, a review of key court cases, and practical exercises that enable participants to reinforce the classroom instructional materials through addressing real-life challenges they may face within their organizations or agencies.

Outcomes:

Upon completion of the course, participants will be able to:

- Explain to agency officials, elected officials and others why clean air requirements exist.
- Identify key federal laws, regulations and policies related to transportation air-quality planning activities.
- Describe how vehicle emission budgets and transportation control strategies are developed and their relationship to the SIP.
- Identify agency conformity responsibilities, and explain how key conformity objectives relate to other transportation-air quality planning processes.
- Describe key components of the transportation planning and project development processes related to air quality planning.
- Describe how stakeholder interactions affect air quality and transportation planning.

Target Audience:

The course is intended for transportation and air quality planners and engineers from State and local departments of transportation, metropolitan transportation organizations, transit agencies, Federal agencies (e.g., Federal Highway Administration, Federal Transit Administration, Environmental Protection Agency, Department of Energy) and State and local environmental agencies. Others include transportation and environmental consultants, public officials and staff members, community and interest groups, as well as other stakeholders in the planning process (e.g., Clean Cities, environmental organizations, Chambers of Commerce, Fleet Managers).

Technical Information	Kevin N. Black	(202) 366-9485 kevin.black@fhwa.dot.gov
NHI Training Program Manager	Mila Plosky	(703) 235-0527 mila.plosky@fhwa.dot.gov

Course Number: 142045A

Course Title: Pedestrian Facility Design

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course was developed to provide information and application opportunities for those involved in the design of pedestrian facilities. The Americans with Disabilities Act (ADA) requires newly constructed and altered sidewalks to be accessible and usable for people with disabilities, and accessibility improvements need to be implemented for existing facilities. To emphasize the importance of planning for pedestrians, the instruction centers on two case examples: one involving corridor design issues; one involving intersection design issues. Participants are engaged through lecture, discussion, video demonstrations of problem areas in corridors and intersections, small group problem identification, and the development of design alternatives.

Outcomes:

Upon completion of the course, participants will be able to:

- List the characteristics of pedestrians and motorized traffic that influence pedestrian facility design.
- Apply the concepts of universal design and applicable design reference material to redesigning an existing location and/or designing a new location that meets the needs of motorized and nonmotorized users.
- Use the reference manual provided in the course to support design decisions for the case example.
- Given a case example, identify potential conflicts between pedestrians and other traffic and propose design options that improve access and safety.
- Given a case example, analyze the network for improvement options to meet the needs of pedestrian and other traffic.

Target Audience:

Engineers with planning, design, construction, or maintenance responsibilities; pedestrian and bicycle specialists; planners; disability and orientation specialists, transportation planners, architects, landscape architects, as well as decision makers at the project planning level.

Technical Information	John Fegan	(202) 366-5007 john.fegan@fhwa.dot.gov
NHI Training Manager	Mila Plosky	(703) 235-0527 mila.plosky@fhwa.dot.gov

Environment

Course Number: 142046A

Course Title: Bicycle Facility Design

Fee: \$225 Per Participant **Length:** 1 Day (CEU: 0.6 Units) **Class Size:** Minimum 20; Maximum 30
(fee includes a copy of AASHTO Guide for the Development of Bicycle Facilities)

Description:

Bicycle facility design is an emerging subject. The availability of Federal, State, and local transportation funding for bicycle facilities that serve transportation and recreational users is resulting in a dramatic increase in the number of facilities being planned and built. Although there are no Federal design standards for bicycle facilities, a newly adopted American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities, or a modification thereof, is being used by many States and localities as the design guide. However, designing bicycle facilities often requires not only the use of the AASHTO Guide, as well as other documents, but also the application of engineering judgment where specific information is not provided. This course will assist planners and designers in learning how to apply the existing standards and how to deal with other technical issues involved.

Outcomes:

Upon completion of the course, participants will be able to:

- List the needs of bicyclists as facility users.
- Identify common roadway and traffic conditions that affect bicyclists.
- Describe the characteristics of a roadway and a shared-use path that are designed to accommodate bicyclists.
- List the benefits to the transportation system of accommodating bicyclists with different abilities.
- Recognize opportunities to accommodate bicyclists during the planning, design, construction and operational phases of a project.

Target Audience:

Federal, State or local engineers with planning, design, construction, or maintenance responsibilities; bicycle specialists; transportation planners; landscape architects, as well as decision makers at the project planning level.

Technical Information	John Fegan	(202) 366-5007 john.fegan@fhwa.dot.gov
NHI Training Program Manager	Mila Plosky	(703) 235-0527 mila.plosky@fhwa.dot.gov

Course Number: 142050A

Course Title: Context Sensitive Solutions

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 40
Course will be available for scheduling after July 2005.

Description:

Context Sensitive Solutions (also known as Context Sensitive Design) is a collaborative, interdisciplinary approach to a transportation project, which involves all stakeholders, early and continually, to develop a transportation facility that equally addresses safety, mobility, and the preservation of scenic, aesthetic, historic, and environmental resources and community values.

Implementation of a CSS process promises to deliver many benefits to an agency, for example, effective and timely decisions, public trust and support, positive relationships with resource agencies, safe and financially feasible project solutions, and overall project delivery process.

One of the FHWA National Strategic Plan's key strategies is to work with its partners to ensure that highway facilities balance local, regional, and national concerns with scenic, aesthetic, historic, and natural environment and that they add value to the community. For that reason, FHWA provides technical assistance to state DOTs in applying CSS concepts within their agencies. FHWA also directly applies CSS concepts within its agency via the Federal Lands Highway (FLH) office, which has an established reputation and expertise in planning, designing and constructing context sensitive transportation facilities in some of the most environmentally, scenically, historical, and culturally sensitive areas of the nation.

This course will provide participants with a variety of tools and techniques to effectively deliver timely and successful transportation projects.

Outcomes:

Upon completion of the course, participants will be able to:

- Explain the CSS' collaborative, interdisciplinary approach to a transportation project (planning through construction stage) and its associated benefits.
- Describe the importance of effective and timely decision-making by ensuring early and continuous involvement of all project stakeholders.
- Describe the flexibility afforded in applying industry design standards (e.g. , AASHTO "Green Book") while maintaining or improving roadway safety performance.
- Explain the importance of achieving environmental sensitivity.
- Discuss how aesthetics and incorporation of community values and themes are an integral part of a good design.
- Name the FLH and the CSS pilot States' "best practices".
- Apply flexibility in highway and bridge design without compromising safety.
- Describe the tools and techniques available to obtain consensus among all the project's stakeholders.
- Apply the course materials and related tools to deliver timely and successful CSS projects.

Target Audience:

This course is broad and includes Federal, State and local highway and transportation agencies located within the U.S., consulting firms, private industry, universities and other national and international entities engaged in any aspect of the planning, design, construction, and management of transportation projects. Transportation professionals like Transportation Planners and Engineers, Environmental Specialists, Highway, Bridge, and Construction Engineers and Designers, Project and Agency Managers.

Technical Information	Jack VanDop	(703) 404-6201 jack.vandop@fhwa.dot.gov
NHI Training Program Manager	Bill Williams	(703) 235-0539 bill.williams@fhwa.dot.gov

Course Number: 142054A

Course Title: Design and Implementation of Erosion and Sediment Control

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30
Originally this course was developed as NHI 134054 under the Construction & Maintenance training category. Since this course applies to Environmental issues, the category is changed to the Environment series and a corresponding NHI number has been assigned.

Description:

A joint effort between FHWA and the Environmental Protection Agency (EPA), this course reflects the agencies' commitment to providing education and training on planning, design, implementation, enforcement, inspection and maintenance strategies to control erosion and sediment on highway construction projects, as well as to ensure that regulatory issues are addressed accurately and uniformly. Each discipline involved in a highway construction project has a different set of priorities. Reflecting NHI's commitment to learner-centered training, the course offers participants opportunities for discussion and joint problem solving, through which they will gain information about the roles and responsibilities of other team members.

Outcomes:

Upon completion of the course, participants will be able to:

- Describe the components of an erosion and sediment control (ESC) plan.
- List the sources of information for the ESC plan.
- Identify management practices and related management measures that are appropriate for typical situations and for a case example.
- List typical construction and inspection problems. Describe both suitable prevention strategies and remedies for failure.
- List Federal and State environmental regulations to the components of the ESC plan.

Target Audience:

A mix of Federal, State and local highway design, construction, inspection and maintenance staff; environmental agency representatives, as well as consultants and members of the construction industry are encouraged to attend to provide their perspectives, learn each other's responsibilities, and explore an array of options to erosion and sediment control.

Technical Information	Patricia Cazenias	(202) 366-4085 patricia.cazenes@fhwa.dot.gov
NHI Training Program Manager	Mila Plosky	(703) 235-0527 mila.plosky@fhwa.dot.gov

Statewide Planning

Course Number: 151018A

Course Title: Application of the FHWA Traffic Monitoring Guide

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course covers the application of procedures used as published in the FHWA's Traffic Monitoring Guide (TMG) and other recent developments in traffic monitoring, including:

- An overview of the application of the TMG procedures to develop data and information needed to support State and National programs including the Highway Performance Monitoring System (HPMS), pavement management, safety management, congestion management, and environmental management.
- Discussion with attendees on specific issues that impact the application of the TMG procedure in traffic counting, vehicle weighing, etc.
- Discussion of automated procedures for data collection and analysis and presentation of examples.
- Discussion of the AASHTO guidelines for traffic monitoring and the coordination of data collection to other Federal and national programs.
- Discussion of Traffic Monitoring System required in Intermodal Surface Transportation Efficiency Act (ISTEA).

Outcomes:

Upon completion of the course, participants will be able to:

- Describe the purpose and appropriate use of the TMG procedures.
- Use the procedures for obtaining data for Federal and State programs.
- Apply the data obtained to answer specific questions on Federal and State issues regarding traffic monitoring.

Target Audience:

FHWA field office planners, and State transportation or planning personnel responsible for or interested in traffic counting, vehicle classification, or truck weight data programs.

Technical Information	Jeff Patten	(202) 366-5052 jeff.patten@fhwa.dot.gov
NHI Training Program Manager	Mila Plosky	(703) 235-0527 mila.plosky@fhwa.dot.gov

Statewide Planning

Course Number: 151021A

Course Title: Administration of FHWA Planning Grants

Fee: \$235 Per Participant **Length:** 1.5 Days (CEU: 0.9 Units) **Class Size:** Minimum 20; Maximum 30

This course will be updated while still offered on a limited basis.

Description:

The course covers the responsibilities and relationships among Federal, State, and local agencies involved in administration of FHWA planning grants to States and State subgrants to Metropolitan Planning Organizations (MPOs) and local governments. It provides a forum for FHWA planning and financial staff, State, MPO, and other local agency staff to discuss the Federal requirements associated with highway planning program grant administration.

The course covers current changes to relevant administrative regulations and directives including: Office of Management and Budget (OMB) Circular A-102; 49 Code of Federal Regulation (CFR) Part 18, Uniform Administrative Requirements for Grants and Cooperative Agreements to State and local governments (US DOT's regulations implementing Circular A-102); and 23 CFR Part 420 (FHWA's regulations for highway planning and research funds). Limited coverage of allowable costs, cost allocation plans, and audit requirements is also included.

Outcomes:

Upon completion of the course, participants will be able to:

- Apply FHWA's regulations for administration of highway planning program grants and subgrants and the relationships among these regulations and 49 CFR Part 18 and applicable OMB circulars.
- Identify the relationships among the FHWA regulations, 49 CFR Part 18 and applicable OMB Circulars.
- Discuss the administrative responsibilities of each agency involved in administration of FHWA highway planning program grants and subgrants.

Target Audience:

FHWA, State, MPOs and local planning agencies who are involved with the use and administration of FHWA planning and research funds. Experience in the use and administration of FHWA planning and research funds would be beneficial.

Technical Information	Tony Solury	(202) 366-5003 tony.solury@fhwa.dot.gov
NHI Training Program Manager	Mila Plosky	(703) 235-0527 mila.plosky@fhwa.dot.gov

Statewide Planning

Course Number: 151034A

Course Title: Development and Implementation of Travel Surveys

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 30

Description:

The course provides transportation planners with information on the development and implementation of the most common types of travel surveys, including: household travel and activity, vehicle intercept, transit on-board, commercial vehicle, work place and establishment, special generator, hotel/visitor, and parking surveys. Much of the course material includes information from the 'Travel Survey Manual,' published by the FHWA. The course is oriented toward those responsible for survey work and those who use the data collected such as modeling practitioners; however, it will not address travel demand modeling explicitly. In addition, the course provides guidance for avoiding common problems encountered in performing travel surveys. The goal of the course is to increase the quality of travel survey results and to promote the efficient utilization of data collection resources.

This 3-day course can be taught with computer or manual exercises. For the computer exercise option, computers will be required for three days and course organizers should arrange for one computer for every two students. A self-instructional CD-ROM will be provided to each participant for both the computer and non-computer options.

Outcomes:

Upon completion of the course, participants will be able to:

- Recognize various types of travel surveys and identify principles behind each.
- Define the relationship of each survey to the travel forecasting process.
- Develop and manage a process for implementing surveys in their local areas.
- Develop high quality requests for proposals for survey efforts, and effectively evaluate the proposals.
- Identify emerging survey techniques and new technologies related to travel surveys.

Target Audience:

Metropolitan Planning Organization, State DOT and FHWA planning practitioners.

Technical Information	Michael Culp	(202) 366-9229 michael.culp@fhwa.dot.gov
NHI Training Manager	Mila Plosky	(703) 235-0527 mila.plosky@fhwa.dot.gov

Statewide Planning

Course Number: 151038A

Course Title: Introduction to Statewide Transportation Planning

Fee: \$270 **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

This course was jointly developed by NHI and the National Transit Institute (NTI). NTI will offer 4 sessions at no cost to Federal, State and local governments and private non-profit transit providers. Those interested in attending these sessions must contact NTI directly: www.ntionline.com. Those interested in hosting a session through NHI may contact the Training Coordinator at (703) 235-0528.

Description:

The course is a collaborative effort among the FHWA Office of Planning, the National Highway Institute, the Federal Transit Administration, the National Transit Institute and various statewide planning, transit and industry representatives to develop a basic— yet comprehensive— course that will serve as an introduction to statewide transportation planning. Designed as an instructor-led, 2-day presentation, the overall course objective is to transfer to participants the necessary knowledge and skills for them to constructively participate in the statewide transportation planning process.

Outcomes:

Upon completion of the course, participants will be able to:

- Illustrate the continuous statewide transportation planning process.
- List the players, their roles and the issues involved in the statewide transportation planning process.
- Explain the relationship of statewide planning to Federal regulations and differing state and local requirements.
- List the required products of the statewide transportation planning process.
- Describe the major elements of a statewide transportation plan.
- Discuss the variety of methods, techniques and strategies to implement the plan.
- Recognize how evaluation methods and performance measures are used in the statewide transportation planning process.
- Recognize noteworthy statewide planning processes.

Target Audience:

New planners (recent graduates without a transportation background); urban planners; DOT staff who are actively involved in statewide planning; engineers who are assigned planning duties but lack academic background in planning; Metropolitan Planning Organization staff; Rural/Regional Planning Organization staff; Regional Development Commissions staff; transit agency staff; those from other Federal resource or regulatory agencies: EPA, Federal Lands, Tribal Governments; college graduates without planning degrees; and consultants involved in transportation planning activities.

NTI Course Scheduling	Ginny Stern	(732) 932-1700 gstern@nti.rutgers.edu
Technical Information	Bob Gorman	(202) 366-5001 bob.gorman@fhwa.dot.gov
NHI Training Program Manager	Mila Plosky	(703) 235-0527 mila.plosky@fhwa.dot.gov

Statewide Planning

Course Number: 151039A

Course Title: Applying GIS and Spatial Data Technologies to Transportation

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course was developed by FHWA in cooperation with the Bureau of Transportation Statistics to train participants in how to implement transportation planning applications that rely on spatial data technologies. Examples of applications using today's major spatial data technologies are described. Aspects of the example applications (i.e., level of effort for development, technological challenges, training needs, and evaluation measures) are discussed. Particular emphasis is placed on cross-cutting implementation issues, both technological and organizational. Exercises are focused on how to make use of spatial data technologies in an environment where data sharing and cooperative agreements are essential components for success. Reflecting NHI's commitment to learner-centered training, the course offers participants opportunities for discussion and joint problem solving, through which they will gain information about the roles and responsibilities of other team members. The overall course goal is to prepare participants to evaluate and plan for the implementation of a variety of transportation planning applications that rely on spatial data technologies.

Outcomes: Upon completion of the course, participants will be able to:

- Recognize emerging/current spatial data technologies.
- List the technologies.
- List the benefits and limitations of each technology.
- Benchmark the trends in terms of high, medium and low risk for implementation.
- State why a transportation planner would want to apply the technology.
- Describe specific examples of applications utilizing spatial data technologies in transportation decision-making.
- Identify common obstacles when implementing each technology.
- Recognize the value of cooperative efforts - both internal and external - when implementing the technologies.

Target Audience:

Participants should have a basic understanding of Geographic Information Systems (GIS) or have completed NHI Course No. 151029 - Applications of GIS for Transportation. Various professional users of spatial data technologies from State departments of transportation, Metropolitan Planning Organizations, County/City governments; professional staff from State/Federal agencies that have cooperative efforts with other agencies such as environmental data warehouses (e.g., Florida, North Carolina); transit agencies; Airport/Port authorities; consultants.

Technical Information	Mark Sarmiento	(202) 366-4828 mark.sarmiento@fhwa.dot.gov
NHI Training Program Manager	Mila Plosky	(703) 235-0527 mila.plosky@fhwa.dot.gov

Statewide Planning

Course Number: 151041A

Course Title: Linking Planning and NEPA: Towards Streamlined Decision-Making

Fee: First 8 sessions are free. All other sessions cost \$30,000 per State offering. **Length:** 3 Days (CEU: 2.4 Units) **Class Size:** Minimum 20 Maximum 50

This course is offered to representatives of the host State only. It is a two-part, offering a four-hour, facilitated, inter-agency Executive Session, followed by a 3-day Managers Workshop. The Executive Session is delivered prior to the Managers Workshop—ideally within two weeks—to allow Executives to discuss their session with their respective managers. FHWA is sponsoring 8 sessions in FY 2005 at no cost to States.

Description:

An opportunity to foster change in the culture that underlies transportation planning and project development is offered by FHWA and the Federal Transit Administration (FTA). The workshops focus on 1) identifying the current planning process and NEPA studies supporting project-level decisions and 2) strategies for achieving greater integration in this work.

At the Executive Session, key managers and directors will review the benefits for improving integration of planning and the NEPA decision-making process. They will develop a Charge for Process Change for their staff who will attend the subsequent Managers Workshop.

Managers Workshop participants will discuss “how to” techniques for carrying out a seamless and collaborative process. Their product will be an Action Plan, listing steps that will bring about better planning and decision-making, leading to enhanced environmental stewardship and streamlined delivery of transportation projects.

Objective:

Upon completion of the course, participants will be able to:

- Describe their planning and project development process—identify the decisions that occur within the process and the important linkages between phases of the process.
- Identify barriers to collaboration and describe techniques that other organizations use to overcome similar barriers and avoid duplication between planning and NEPA.
- Explain the changing nature of alternatives within their process and describe the kinds of information needed for sound decision-making at each phase.
- Adopt a set of basic planning principles that support a sound analysis of alternatives and guide staff in the use of these principles to inform decision-making.
- Accept environmental stewardship as a legitimate and beneficial goal for transportation agencies and explain how this goal will be manifested in their process.
- Manage a multi-faceted, seamless and linked planning and project development process.
- Develop an Action Plan for linking planning and the NEPA process into a seamless framework for decision-making.

Target Audience:

Key Federal, State and other managers from transportation and environment agencies with responsibility for particular geographic areas. These include transportation staff from the FHWA, FTA, DOTs, MPOs, transit agencies, and state/county/local planning agencies, tribal governments and environment staff from the Environmental Protection Agency, the Army Corps of Engineers, the Fish and Wildlife Service, National Park Service, State departments of environmental resources, State and local air quality agencies, State historic preservation office, tribal governments.

Technical Information	Rob Ritter	(202) 493-2139 robert.ritter@fhwa.dot.gov
NHI Training Program Manager	Mila Plosky	(703) 235-0527 mila.plosky@fhwa.dot.gov

Training Coordinator (703) 235-0528 Fax (703) 235-0593 Email NHITraining@fhwa.dot.gov
www.nhi.fhwa.dot.gov

Course Number: 152054A

Course Title: Introduction to Urban Travel Demand Forecasting

Fee: \$530 Per Participant **Length:** 4 Days (CEU: 2.4 Units) **Class Size:** Minimum 20; Maximum 30

The hosting organization is responsible for providing MS-DOS microcomputers with color graphics, color monitors and at least 10 MB hard disk space. No more than two participants per computer station.

Description:

This is a 4-day introductory course in travel demand forecasting. Through classroom lecture and interactive workshops, the course covers the traditional four-step planning process of trip generation, trip distribution, mode choice and traffic assignment. It also includes presentations on the development of land use forecasts, network and zone structures and use of Geographic Information Systems. The course also includes software applications to problems previously solved manually to reinforce the concepts taught in the classroom. The course is offered in the field upon request and is periodically sponsored by the FHWA Resource Center.

Outcomes:

Upon completion of the course, participants will be able to:

- Identify the principles of trip generation, trip distribution, mode choice, and traffic assignment.
- Apply the input data necessary for each of the models.
- Illustrate the significance of the outputs and results of travel demand forecasting models.
- Describe the role of urban transportation planning in decision-making.

Target Audience:

Relatively new Federal, State and local planners who wish to gain a better understanding of the principles and techniques of travel demand forecasting. Computer experience is required.

Technical Information	Michael Culp	(202) 366-9229 michael.culp@fhwa.dot.gov
NHI Training Program Manager	Mila Plosky	(703) 235-0527 mila.plosky@fhwa.dot.gov

Metropolitan Planning

Course Number: 152069A

Course Title: Metropolitan Transportation Planning

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 35

This course was jointly developed by NHI and the National Transit Institute (NTI). NTI will offer 6 sessions at no cost to Federal, State and local governments and private non-profit transit providers. Those interested in attending these sessions must contact NTI directly: www.ntionline.com. Those interested in hosting a session through NHI may contact the Training Coordinator at (703) 235-0528.

Description:

This course provides a general introduction and overview of the metropolitan transportation planning process, underscoring its relationship to informed decision-making. Aspects covered include: key elements of the planning process; planning requirements; visioning, goals, objectives and measures of effectiveness; program and project development; alternatives and tools for their analysis.

Outcomes:

Upon completion of the course, participants will be able to:

- Explain why the metropolitan transportation planning process exists and why it is important.
- Identify the requirements of the metropolitan transportation planning process and describe the products.
- Identify the players in the process and describe their roles and responsibilities.
- Distinguish among vision, goals, objectives and measures of effectiveness (MOEs) and describe the proper use of each.
- Explain how to identify transportation needs and problems and how to analyze and evaluate alternative strategies.
- Recognize the components of the Transportation Plan and the Transportation Improvement Program.
- Explain the relationship between planning and project development.
- Describe why planning is a continuous process, requiring monitoring of the system condition and performance.

Target Audience:

Planning, transportation planning, programming or project development staff working or participating in the metropolitan transportation planning process. These include participants from: Metropolitan Planning Organizations, state or local departments of transportation, transit agencies or Federal DOT. In addition, Federal or state resource and regulatory agencies, (e.g., EPA, Army Corps of Engineers, US Coast Guard, Fish And Wildlife Service, or Park Service).

NTI Course Scheduling	Ginny Stern	(732) 932-1700 gstern@nti.rutgers.edu
Technical Information	Sherry Ways	(202) 366-1589 sherry.ways@fhwa.dot.gov
NHI Training Program Manager	Mila Plosky	(703) 235-0527 mila.plosky@fhwa.dot.gov

Metropolitan Planning

Course Number: 152071A

Course Title: Estimating Regional Mobile Source Emissions

Fee: \$460 Per Participant **Length:** 3.5 Days (CEU: 2.1 Units) **Class Size:** Minimum 20; Maximum 30

Description:

The transportation conformity provisions of Clean Air Act Amendments of 1990 (CAAA) and planning provisions of the Transportation Equity Act for the 21st Century (TEA-21) require areas that violate the National Ambient Air Quality Standards (NAAQS) to demonstrate that through the transportation conformity process, transportation investments have air quality impacts consistent with the clean air goal of the State Implementation Plan (SIP). Estimating the amount of mobile source emissions is a crucial part of this process. Metropolitan Planning Organizations (MPOs) and State departments of transportation (DOTs) have the responsibility of creating mobile source emissions estimates to support transportation conformity determinations in areas that violate NAAQS. These emissions estimates are based on travel demand models, Highway Performance Monitoring System (HPMS) data, and emission rate models. In addition, planners from air agencies are responsible for developing mobile source emissions inventories based on a similar set of assumptions and techniques. It is in the interest of the MPOs and DOTs as well as air agencies to perform this analysis using best practice analysis techniques. The focus of this training course is to develop the skills of planners and practitioners responsible for estimating mobile source emissions so they can incorporate these techniques into practice in their areas. This course has been developed in coordination with the US Environmental Protection Agency (EPA).

Outcomes:

Upon completion of the course, participants will be able to:

- Develop estimates of Vehicle Miles Traveled (VMT) by speed.
- Develop MOBILE 6 emissions factors.
- Develop regional emissions estimates.
- Describe techniques to estimate emission benefits of selected transportation control measures (TCMs).

Target Audience:

Participants should have 1-3 years experience in travel demand forecasting, conformity or air quality analysis or have completed NHI Course No. 152054 - Introduction to Travel Demand Forecasting and/or the National Transit Institute's Introduction to Transportation/Air Quality Conformity course. This course is targeted to: Transportation Planning staff from State DOTs and MPOs staff from other governmental agencies who are responsible for developing mobile source emissions estimates to support conformity determinations; FHWA, FTA and EPA staff involved in the conformity process as it relates to travel demand forecasting and mobile source emissions estimates transit operators who participate in developing mobile source emissions estimates; and consultants who are involved in this field.

Technical Information	Michael Culp	(202) 366-9229 michael.culp@fhwa.dot.gov
NHI Training Program Manager	Mila Plosky	(703) 235-0527 mila.plosky@fhwa.dot.gov

Financial Management

Course Number: 231013A

Course Title: Highway Program Financing

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 40

This course is not being scheduled until the new Federal-Aid authorization bill is passed.

Description:

This course covers the various aspects of Federal-aid highway financing unique to the FHWA program. Topics include, but are not limited to:

- The content and policy implication of authorizing and appropriating legislation.
- The way Federal-aid highway funds are distributed to the States, including discussion of contract authority, apportionment and allocation, deductions, earmarking, transferability, and obligation.
- The effect of policy and budget considerations on the use of Federal-aid funds, especially as manifested through obligation limitations.
- The operation of the Highway Trust Fund and its significance to the funding level for the Federal-Aid Highway Program.

Outcomes:

Upon completion of the course, participants will be able to:

- Describe the flow of Federal financing from authorization to reimbursement, including the apportionment and allocation processes, deductions, earmarkings, and obligations.
- Use correct terminology to describe the financing process.
- Discuss the impact contract authority and the obligation limitation have on the use of Federal funds.
- Interpret how the Federal budgetary process applies to the Federal-Aid Highway Program.
- Describe the significance of the Highway Trust Fund to the funding levels for the Federal-Aid Highway Program.

Target Audience:

State and local government employees and private sector participants interested in the process by which the Federal-Aid Highway Program receives and distributes funding. Course hosting organizations are encouraged to invite attendees from a variety of sources.

Technical Information	Bob Meredith	(202) 366-6786 robert.meredith@fhwa.dot.gov
NHI Training Program Manager	Mila Plosky	(703) 235-0527 mila.plosky@fhwa.dot.gov

Business, Public, Administration, and Quality

Course Number: 310108A

Course Title: Federal Lands 101

Fee: \$400 Per Participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 30

Description:

During these times of economic expansion and growth, there are dramatic workforce changes taking place. With the passage of TEA-21, the program for Federal Lands Highway (FLH) nearly doubled and there is the prospect that it will again increase under pending transportation reauthorization. This coupled with the increasing demand by our partners and customers for more technical assistance, FLH needs to develop their new/mid-career hires in the area of FLH operations and regulations. Therefore, the overall course goal is to provide FLH employees with an overview of how FLH operates in order to administer programs; deliver projects; develop and transfer technology; and provide external training.

Outcomes:

Upon completion of the course, participants will be able to:

- Identify the role and authorities of FLH within the FHWA and its interactions with Federal-aid Divisions.
- Describe unique aspects of FLH customers and programs.
- Describe how FLH delivers projects.
- Describe how FLH conducts business, including processes and resources.

Target Audience:

New hires to FLH in all positions and grades and Federal-aid (particular new employees) and Federal Lands Management Agency employees upon request.

Technical Information	Don Tuggle	(703) 404-6201 don.tuggle@fhwa.dot.gov
NHI Training Program Manager	Bill Williams	(703) 235-0539 bill.williams@fhwa.dot.gov

Course Number: 310109A

Course Title: Federal-Aid 101 (FHWA Employee Session)

Fee: \$460 Per Participant **Length:** 3.5 Days (CEU: 2.1 Units) **Class Size:** Minimum 25; Maximum 30

Highway Program Finance Course would be helpful but is not required.

Description:

During this time of economic expansion and growth, there are dramatic workforce changes taking place. Given the increasing demand by our partners and customers for more technical assistance, FHWA needs to develop their new/mid-career hires in the area of the Federal-Aid processes and regulations. Therefore, the overall course goal is to provide FHWA employees, particularly mid-career hires, with an overview of the key elements of the Federal-Aid Highway Program. Specifically, this course focuses on general requirements and laws that govern the Federal-Aid Highway Program; processes and procedures followed in the project development; and identifying flexibility inherent in the Federal-Aid Program.

Outcomes:

Upon completion of the course, participants will be able to:

- Identify the key elements of the overall project development process.
- Identify the FHWA Civil Rights Programs (i.e., Title VI, Disadvantaged Business Enterprise (DBE), EEO Contract Compliance, Title VII, Americans with Disabilities Act (ADA), Indian Outreach) and their relationship to the Federal-Aid Highway Program and the Federal/State relationships.
- Integrate Environmental Justice into all aspects of project planning, development and
- Develop a flowchart of the project development process from the initial planning concept through the environmental and right-of-way processes, on to construction and opening to traffic.
- Identify the roles of Safety, Intelligent Transportation Systems, Operations, Research and development in the Federal-Aid process.
- Identify ways used for public involvement early in the process.
- Learn the fundamentals of several innovative financing techniques that will maximize the use of Federal-Aid funds.
- Develop a network of professionals that can be contacted for help.
- Discuss how the Federal-Aid laws and regulations relate to the other laws (i.e., NEPA, Uniform Act, the Davis Bacon Act, OMB Circular A-87, 49 CFR part 18 (Common Rule)).

Target Audience:

New/Mid Career Hires - This course is for all disciplines, (i.e., planners, engineers, environmental specialists, financial specialists or managers).

Technical Information	Michael Graf	(302) 734-1946 michael.graf@fhwa.dot.gov
NHI Training Program Manager	Bill Williams	(703) 235-0539 bill.williams@fhwa.dot.gov

Course Number: 310110A

Course Title: Federal-Aid Highways - 101 (State Version)

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

Description:

During this time of economic expansion and growth, there are dramatic workforce changes taking place. Given the increasing demand by our partners and customers, it is critical to develop State DOT employees in the area of the Federal-aid highway development processes and regulations. Therefore, the overall course goal is to provide participants with an overview of the key elements of the Federal-Aid Highway Program. Specifically, this course focuses on general requirements and laws that govern the Federal-Aid Highway Program; processes and procedures followed in the entire project development process including: financing, planning, environment, right of way, highway and bridge design, construction, operations/ITS, maintenance and technology; and identifying flexibility inherent in the Federal-Aid Program.

Outcomes:

Upon completion of the course, participants will be able to:

- Identify the key elements of the overall highway project development process.
- Identify the elements and requirements of the Federal-Aid Highway Program and the associated Federal/State relationships.
- Develop a flowchart of the project development process from the initial planning concept through the environmental and right-of-way processes, on through design, construction and opening to traffic.
- Identify the roles of Safety, Intelligent Transportation Systems, Operations, Research and development in the Federal-aid process.
- Identify the need for public involvement early in the process; opportunities for application of the principles of environmental justice/civil rights; context sensitive solutions, etc.
- Discuss the fundamentals of federal-aid financing, including several innovative financing techniques that will maximize the use of Federal-aid funds.
- Develop a network of professionals that can be contacted for help.
- Discuss how the Federal-aid laws and regulations relate to other laws (i.e., NEPA, Uniform Act, the Davis Bacon Act, OMB Circular A-87, 49 CFR part 18 (Common Rule); and to FHWA regulations, policies, technical guidance, etc.

Target Audience:

State and local government employees and private sector participants interested in the process by which the Federal-Aid Highway Program is carried out.

Technical Information	Michael Graf	(302) 734-1946 michael.graf@fhwa.dot.gov
NHI Program Manager	Bill Williams	(703) 235-0539 bill.williams@fhwa.dot.gov

Course Number: 310111A

Course Title: Conducting Reviews that Get Results

Fee: Per Participant **Length:** 1.5 Days (CEU: 0.9 Units) **Class Size:** Minimum 20; Maximum 30

A limited number of sessions are being sponsored by the Offices of Infrastructure and Office of Professional and Corporate Development with no participant fee charged to the hosting Division Office. This is a hands-on workshop, 1.5 days in length (can be tailored from 0.5 to 2.0 days), covering the planning, design and tools needed for a review to have the maximum impact.

Description:

To accomplish FHWA's Stewardship Mission, units at every level and in every program area need the expertise to plan, design and carry out, often jointly with partners, reviews to ensure that operational processes are consistent with established standards and expectations, performing at the most effective and efficient level, and that best practices are captured and made available to units at all levels. Building on FHWA experience and expertise gained through PR/PE's, Process Reviews, and Continuous Process Improvement Reviews, an improved workshop, tailored to the unit's needs, is now being offered through a partnership between the Offices of Professional and Corporate Development, with input from the Resource Center and several Division Offices. The Workshop consists of assistance, focused on your reviews, in the form of consultation, training and hands on assistance in the methodology and tools for conducting successful reviews.

How is it done?

A team of trainers:

- Help the participant assess which assistance is needed, via teleconference;
- Deliver assistance in the form of the module(s) dictated by review conditions:
 - establish the review's purpose and objectives (team charter)
 - develop review guidelines
 - plan for and collect relevant data
 - analyze information to develop recommendations
 - report and present review recommendations
 - action planning, implementation, monitoring

Outcomes:

Upon completion of the course, participants will be able to:

- Use the Team Charter to build partnerships and confidence in the review approach.
- Explain the methods of review planning to identify desired results and needed information.
- Describe effective data collection methodology.
 - Describe effective data analysis methodology.
 - Describe effective presentation and marketing methodology.
 - Describe how to formulate recommendations that can be implemented.

Target Audience:

Division Offices looking to charge up their review programs and Review Teams established and charged with conducting unit process or program reviews, compliance verification reviews, improvement reviews, and/or National Program Reviews. The workshop can be conducted at any critical stage of the review, from planning to implementation.

Technical Information	Chris Newman	(202) 366-2023 christopher.newman@fhwa.dot.gov
	Denise Bednar	(708) 283-3503 denise.bednar@fhwa.dot.gov
NHI Training Program Manager	Bill Williams	(703) 235-0539 bill.williams@fhwa.dot.gov

Civil Rights

Course Number: 361019A

Course Title: On the Road to Equality: Women in Highway Construction

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 40

The essential material covered in this course is currently available in the 4 1/2 day course titled "Basic FHWA Civil Rights Program Management" which is presented by the FHWA Civil Rights Office.

Description:

This course provides State Highway Agencies (SHAs) and construction contractors with information and tools which will aid them in increasing the employment and retention of women in the skilled trades in the highway construction workforce. A variety of instructional techniques are employed, including lectures, group discussions, case studies, team consensus, and visual aids. Each participant receives a copy of the manual "On the Road to Equality: Women in Highway Construction," which serves as a valuable reference. Course host agrees to provide 20 to 40 participants, with a minimum of one-third construction contractors. For the purpose of a short panel presentation on the second day, host agrees to provide three to four women currently working in the skilled crafts of construction.

Outcomes:

Upon completion of the course, participants will be able to:

- Describe the past and current status of women in highway construction.
- Describe the benefits of women in highway construction.
- Identify and interpret the current and specific laws and regulations that impact women in highway construction.
- Identify ways to increase employment opportunities and the strategies necessary to retain women in highway construction.
- Identify methods and techniques to prevent sexual harassment in highway construction.
- Identify skills training and understand the need for training women in highway construction.
- Recognize the importance of contractor equal opportunity compliance reviews and provide strategies to correct identified deficiencies relative to women in construction.
- Identify national and local agencies and groups that can assist contractors and women to increase women's involvement in highway construction work.

Target Audience:

State personnel and highway construction contractors. The State personnel should have responsibility for assuring equal employment opportunity in highway construction. Community-based organizations that provide orientation for women in non-traditional occupations are invited.

Technical Information	Humberto R. Martinez	(817) 978-3671 humberto.martinez@fhwa.dot.gov
NHI Training Program Manager	Bill Williams	(703) 235-0539 bill.williams@fhwa.dot.gov

Civil Rights

Course Number: 361020A

Course Title: Partnering for Native American Employment in Highway Construction

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course provides State Transportation Agencies (STAs), highway construction contractors, and Tribal representatives with information and tools which will assist them in working together to increase the employment and retention of Native Americans in the highway construction workforce. A variety of instructional techniques are employed, including lectures, group discussion, team consensus, and visual aids. Emphasis is placed on the creation of an “Action Plan” for the host State to increase the employment of Native Americans in highway construction. Participants receive a copy of the “Partnering for Indian Employment in Highway Construction” manual which serves as a valuable reference. Course hosts must agree to provide 20 to 30 participants, with a balanced mix of participants from the three groups: State, Tribal, and contractors.

The National Highway Institute requires at least 3 months advance notice to schedule this course.

Outcomes:

Upon completion of the course, participants will be able to:

- Outline the benefits associated with the increased employment of Native Americans in Federal-aid highway construction.
- Recognize the need for partnering among Tribal, State and Federal governments, and highway construction contractors.
- Identify Federal and State laws, regulations, and directives related to Indian employment preference for Federal-aid highway construction on and near Reservations.
- Explain the purpose and nature of Tribal employment laws and requirements.
- Recognize the cultural differences among the stakeholders—Tribes, Federal/State governments, and highway construction contractors.
- Identify potential employment barriers caused by cultural differences among the stakeholders.
- Create practical and innovative strategies to increase the employment of Native Americans in highway construction.

Target Audience:

State transportation agencies, Tribal employment representatives, and highway construction contractors. The State personnel should have direct or indirect responsibility for assuring equal employment opportunity in highway construction.

Technical Information	Teresa Banks	(404) 562-3592 teresa.banks@fhwa.dot.gov
NHI Training Program Manager	Bill Williams	(703) 235-0539 bill.williams@fhwa.dot.gov

Highway Safety

Course Number: 380003A

Course Title: Design and Operation of Work Zone Traffic Control

Fee: \$200 Per Participant **Length:** 1 Day (CEU: 0.6 Units) **Class Size:** Minimum 20; Maximum 30
\$400 Per Participant 3 Days (CEU: 1.8 Units)

Description:

This course provides participants with information on the safest and most efficient work zone traffic controls, including: the application of effective design and installation concepts; and using signs and markings for detours, construction zones and maintenance sites. The legal, administrative, and operational aspects also will be discussed. Classroom presentations include lectures, case histories and workshops.

Outcomes:

Upon completion of the course, participants will be able to:

- Describe each step involved in providing work zone traffic controls.
- Identify and apply workable concepts and techniques for designing, installing, and maintaining controls in construction, maintenance, and utility operations.
- Identify appropriate principles in the design of traffic control plans.
- Apply traffic control plans to site conditions, monitor traffic controls, and make changes indicated by traffic accidents and incidents.
- Discuss techniques and procedures used by different agencies.
- Assess the legal consequences of action and inaction relative to work zone traffic control and identify risk management procedures.

Target Audience:

Design, construction, and maintenance personnel responsible for designing, installing, and monitoring work zone traffic control.

Technical Information	Michael Robinson	(202) 366-2193 mike.robinson@fhwa.dot.gov
NHI Training Program Manager	Bill Williams	(703) 235-0539 bill.williams@fhwa.dot.gov

Highway Safety

Course Number: 380005A

Course Title: Railroad-Highway Grade Crossing Improvement Program

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

Description:

The training course provides information on rail-highway crossings, grade crossing components, including program/project development and administration. Workshops will provide the participants a chance to make “hands-on” applications of the training material, which include such topics as:

- Historical background.
- Railroad-highway intersection definition and components.
- Collection and maintenance of data.
- Assessment of crossing safety and operations.
- Identification and selection of alternate improvements.
- Program and project development and implementation.
- Maintenance.
- Other topics (i.e., private crossings, operation lifesaver).

Outcomes:

Upon completion of the course, participants will be able to:

- Develop and implement improvements to railroad-highway grade crossings.
- Identify and evaluate techniques and engineering principles used for all crossings.

Target Audience:

Federal, State, and local transportation agencies responsible for the design, construction, and/or maintenance of railroad-highway crossings. State and local traffic engineers responsible for highway-railroad grade crossing safety.

Technical Information	Dee Chappell	(202) 366-0087 debra.chappell@fhwa.dot.gov
NHI Training Program Manager	Bill Williams	(703) 235-0539 bill.williams@fhwa.dot.gov

Highway Safety

Course Number: 380032A

Course Title: AASHTO Roadside Design Guide

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course provides an overview of the AASHTO "Roadside Design Guide." Emphasis is on current highway agency policies and practices. Each student will receive a copy of the AASHTO "Roadside Design Guide" as the course text.

Outcomes:

Upon completion of the course, participants will be able to:

- Apply the clear zone concept to all classes of roadways.
- Recognize unsafe roadside design features and elements and make appropriate changes.
- Identify the need for a traffic barrier.
- Select, design and install a traffic barrier.
- Apply safety concepts to roadside features and appurtenance selection/use in work zones.
- Compare alternate safety treatments and select a cost-effective design.
- Identify policies and practices that are inconsistent with current state-of-the-art.

Target Audience:

Federal, State and local highway engineers involved in the formulation and/or application of policies and standards relating to the design of safer roadsides.

Technical Information	Richard Powers	(202) 366-1320 richard.powers@fhwa.dot.gov
NHI Program Manager	Bill Williams	(703) 235-0539 bill.williams@fhwa.dot.gov

Highway Safety

Course Number: 380032C

Course Title: AASHTO Roadside Design Guide, Web Based

Fee: \$230 Per Participant **Length:** 14 Hours (CEU: 1.4 Units) **Class Size:** Minimum 1; Maximum 1

Recommended System Specifications:

- 600 MHz Intel Pentium III processor or equivalent with a minimum of 128 MB RAM
- Windows 98 Second Edition, ME, NT 4.0 with Service Pack 6a, 2000 with Service Pack 4, or XP
- Audio capability (Windows Media Player or equivalent) with speakers
- Microsoft Internet Explorer v6, Netscape v7, Mozilla v1.1 or higher with JavaApplet and ActiveX enabled
- Flash 5 or higher plug-in installed
- Color Video Display (800x600) with thousands of colors (16-bit)
- DSL or higher speed Internet connection strongly recommended (Audio/animations may be slow at dial-up modem speeds)

Description:

This course provides an overview of the AASHTO "Roadside Design Guide." Emphasis is on current highway agency policies and practices. Each student will receive a copy of the AASHTO "Roadside Design Guide" as the course text.

Outcomes:

Upon completion of the course, participants will be able to:

- Apply the clear zone concept to all classes of roadways.
- Recognize unsafe roadside design features and elements and make appropriate changes.
- Identify the need for a traffic barrier.
- Select, design and install a traffic barrier.
- Apply safety concepts to roadside features and appurtenance selection/use in work zones.
- Compare alternate safety treatments and select a cost-effective design.
- Identify policies and practices that are inconsistent with current state-of-the-art.

Target Audience:

Federal, State and local highway engineers involved in the formulation and/or application of policies and standards relating to the design of safer roadsides. Participant must register on-line at www.nhi.fhwa.dot.gov/registerdl.asp. Participant information, billing address, and credit card information must be provided when registering on-line.

Technical Information	Richard Powers	(202) 366-1320 richard.powers@fhwa.dot.gov
NHI Training Program Manager	Bill Williams	(703) 235-0539 bill.williams@fhwa.dot.gov

Highway Safety

Course Number: 380034A

Course Title: Design, Construction, and Maintenance of Highway Safety Appurtenances and Features

Fee: \$200 Per Participant **Length:** 1 Day (CEU: 0.6 Unit) **Class Size:** Minimum 20; Maximum 30

Description:

The course has been developed for a 3-day course presentation but can also be structured into a 1- or 2-day training course. The sponsoring agency will be able to choose the modules for presentation that will best meet their needs. The course covers the design, construction, and maintenance of highway safety appurtenances and features. It covers the purpose and performance requirements of state-of-the-art highway safety features, such as breakaway sign supports, breakaway utility poles, traffic barriers, impact attenuators, traversable terrain and hardware features such as drainage inlets. The course describes how these features function, what can go wrong, and how to recognize and correct improper installations.

Outcomes:

Upon completion of the course, participants will be able to:

- Identify advantages and disadvantages of different types of longitudinal barriers and crash cushions.
- Identify National Cooperative Highway Research Program 350 tested safety appurtenances.
- Identify application of highway safety appurtenances, why they are used, when and where they should be used, and what is necessary to ensure their function.
- Design the placement of, and determine the need for, longitudinal barriers.
- Use required installation, construction, and maintenance procedures for proprietary longitudinal barriers, terminals, transitions, crash cushions, bridge railings, and sign supports.
- Recognize substandard or potentially hazardous highway appurtenances and features.
- Develop alternatives to eliminate, correct, or mitigate unsatisfactory operational characteristics of existing safety devices.

Target Audience:

Highway engineers, including local personnel involved in the design, construction, or maintenance of highway safety appurtenances and features. This course is suitable for all local, State and Federal employees that are involved with the installation and repair of highway appurtenances.

Technical Information	Harry Taylor	(202) 366-2249 harry.taylor@fhwa.dot.gov
NHI Training Program Manager	Bill Williams	(703) 235-0539 bill.williams@fhwa.dot.gov

Highway Safety

Course Number: 380060A

Course Title: Work Zone Traffic Control for Maintenance Operations (Short Term)

Fee: \$200 Per Participant **Length:** 1 Day (CEU: 0.6 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course provides guidance and training for field personnel working in the planning, selection, application, and operation of short-term work zones. The course addresses typical short-term maintenance activities occurring on two-lane rural highways and multi-lane urban streets and highways. The course covers the applicable standards for work zone protection contained in the Manual on Uniform Traffic Control Devices (MUTCD), discussing the need for proper application of devices, while addressing liability issues of highway agencies and individuals. Classroom presentation includes practical exercises to plan, set up, operate, and remove work zone safety devices, including appropriate flagging procedures for these operations.

Outcomes:

Upon completion of the course, participants will be able to:

- Apply traffic control through short term and mobile work areas.
- Use national work zone standards and requirements as contained in Part VI of the MUTCD.
- Use standard traffic control devices in work zones.
- Design traffic control schemes for short term and mobile operations on rural two- and multi-lane streets and highways.
- Apply proper flagging procedures.
- Explain how to minimize liability exposure for agencies performing utility and maintenance work.

Target Audience:

State, county, and utility personnel who are responsible for establishing traffic controls through short-term, utility and maintenance work areas such as maintenance crews, survey crews, and utility crews.

Technical Information	Michael Robinson	(202) 366-2193 mike.robinson@fhwa.dot.gov
NHI Training Program Manager	Bill Williams	(703) 235-0539 bill.williams@fhwa.dot.gov

Highway Safety

Course Number: 380063A

Course Title: Construction Zone Safety Inspection

Fee: \$200 Per Participant **Length:** 1 Day (CEU: 0.6 Units) **Class Size:** Minimum 20; Maximum 30
\$235 Per Participant 1.5 Days (CEU: 0.9 Units)

Description:

This course provides training in the management of traffic control plans and the inspection of construction zone safety devices. Participants receive instruction in traffic control plan review, inspection of traffic control procedures and safety devices, and the resolution of discrepancies from the traffic control plan, as well as on deficiencies in safety hardware maintenance. The following major topics are covered:

- Inspection of traffic control plan operation
- Maintenance of work zone signs and markings
- Inspection of construction safety hardware
- Resolution of discrepancies from contract requirements

Outcomes:

Upon completion of the course, participants will be able to:

- Recognize the importance of construction zone safety devices.
- Identify the contract requirements for selected devices.
- Inspect the installation and operation of safety devices, including discrepancies and deficiencies in safety devices.
- Resolve discrepancies from the contract requirements and ensure corrections in the deficient safety devices.

Target Audience:

FHWA safety engineers, FHWA highway engineers, and State and local personnel involved in the management of traffic control plans and the inspection of construction zone safety devices.

Technical Information	Michael Robinson	(202) 366-2193 mike.robinson@fhwa.dot.gov
NHI Program Manager	Bill Williams	(703) 235-0539 bill.williams@fhwa.dot.gov

Highway Safety

Course Number: 380069A

Course Title: Road Safety Audits and Road Safety Audit Reviews

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

Description:

Participants in this training will learn how to improve transportation safety by applying a new proactive approach "Road Safety Audits (RSA) and Road Safety Audit Review (RSAR)." This technique provides an examination of a future or existing roadway by an independent, qualified audit team. The RSA is a way for an agency to improve safety and to communicate to the public how the agencies working toward accident reductions.

This course includes "hands-on" application of the training materials which include such topics as:

- Road Safety Audit definition and history.
- Why care about safety.
- Stages of a Road Safety Audit.
- Details on how to conduct a Road Safety Audit.
- Easy-to-use checklists.
- Legal considerations.

This training provides practical information on how to conduct a Road Safety Audit. Students will receive a copy of the "Road Safety Audits and Road Safety Audit Reviews Reference Manual."

Outcomes:

Upon completion of the course, participants will be able to:

- Express the Road Safety Audit process terminology.
- Perform a simple Road Safety Audit, as a member of a team.
- Assess the benefits of a Road Safety Audit on a statewide basis.

Target Audience:

Federal, State and local transportation personnel who are likely to serve on a Road Safety Audit team. Consultants who conduct highway safety studies also may attend.

Technical Information	Louisa Ward	(202) 366-2218 louisa.ward@fhwa.dot.gov
NHI Training Program Manager	Bill Williams	(703) 235-0539 bill.williams@fhwa.dot.gov

Highway Safety

Course Number: 380070A

Course Title: Safety and Operational Effects of Geometric Design Features for 2- Lane Rural Highways

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

Note: Bring a scientific notation calculator for calculations of decimal value to decimal power for crash prediction values.

Description:

This course provides quantitative safety assessment methods to the design process for two-lane rural highways. Emphasis is on the application of safety research results to design decisions for application of the requirements and guidelines detailed in the 2001 AASHTO Green Book for curvature, lane width, shoulder width, grade, and intersection. Each student will receive a copy of the "Safety and Operation Effects of Highway Design Features for Two-Lane Rural Highways" manual.

Outcomes:

Upon completion of the course, participants will be able to:

- Identify changes in geometric design practices detailed in the AASHTO 2001 Green Book.
- Recognize the safety effects of geometric design features.
- Calculate the quantitative safety measures of geometric design features.
- Apply reconstruction to only those segments/features with higher than expected crash experience.
- Compare alternative designs based upon an assessment of the safety effects of geometric design features.

Target Audience:

State and local highway engineers and consultants involved in the design of two-lane rural highways.

Technical Information	Fred Ranck	(708) 283-3545 fred.ranck@fhwa.dot.gov
NHI Training Program Manager	Bill Williams	(703) 235-0539 bill.williams@fhwa.dot.gov

Highway Safety

Course Number: 380071A

Course Title: Interactive Highway Safety Design Model

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

No more than 2 participants per computer. Minimum System Specifications:

Operating System - Windows 95, 98, NT 4.0, Me, 2000 Professional or XP.

HTML Browser - Microsoft Internet Explorer, Netscape Navigator, Foxfire or Mozilla.

Hardware - At least 450 MHz x 86 compatible CPU, 128 MB RAM, 800x600 high colors (16 bit), 300 MB free disk space.

Description:

This course will instruct highway design project managers, planners, designers, and traffic and safety reviewers in the application of the Interactive Highway Safety Design Model (IHSDM) software and will provide guidance on interpretation of the output.

IHSDM is a suite of software tools to evaluate safety of two-lane rural highways. The software, developed for FHWA, was released in 2003 after several years of research and development to provide state-of-the-art techniques for safety analysis. IHSDM contains five tools that can be used to apply the most recent safety analysis techniques in a relatively straightforward and automated manner. For more information about IHSDM, go to <http://www.tfhr.gov/safety/ihsdm/ihsdm.htm>.

Outcomes:

Upon completion of the course, participants will be able to:

- Describe key capabilities and limitations of IHSDM.
- Evaluate a two-lane rural highway using IHSDM.
- Recognize when and how IHSDM can be used in the project development process.

Target Audience:

Highway design project managers, planners, designers, and traffic and safety reviewers with at least one or two years of experience with highway design, preferably two-lane rural highway design.

Technical Information	Clayton Chen	(202) 366-4656 clayton.chen@fhwa.dot.gov
	Ray Krammes	(202) 493-3312 ray.krammes@fhwa.dot.gov
NHI Training Program Manager	Bill Williams	(703) 235-0539 bill.williams@fhwa.dot.gov

Highway Safety

Course Number: 380073A

Course Title: Fundamentals of Planning, Design & Approval of Interchange Improvements to the Interstate System

Fee: \$270 Per Participant **Length:** 2 Days (CEU: 1.2 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course presents the fundamentals of Planning, Design and Approval of Interchange Improvements to the Interstate System. It includes service and system interchange types, 8 point interchange justification process, interchange study and selection process, fundamentals of freeway system operations and planning, urban freeway diagnosis, geometric design considerations, and technical and documentation procedures. The training includes several major work problems.

Outcomes:

Upon completion of the course, participants will be able to:

- Compare and contrast the traffic operational and design attributes of different service interchange types.
- Develop an understanding of the eight elements of the FHWA policy including their intent.
- Review and apply the 12 Principles of Good Urban Freeway Planning and Design.
- Review key geometric features of ramps, terminals, alignment, and cross section.
- Understand the application of FHWA design exception policies with respect to interchange design elements, features and decisions.
- Learn who and which FHWA offices are responsible for approvals.
- Learn the general contents of an Interchange Justification Report (IJR) and explain the components of a complete operational analysis, including the manner in which safety is assessed.

Target Audience:

Highway design engineers, traffic engineers and safety engineers that are responsible for the design and approval of interchange improvements to the Interstate System.

Technical Information	Fred Ranck	(708) 283-3545 fred.ranck@fhwa.dot.gov
NHI Training Program Manager	Bill Williams	(703) 235-0539 bill.williams@fhwa.dot.gov

Highway Safety

Course Number: 380074A

Course Title: Designing and Operating Intersection for Safety

Fee: \$400 per participant **Length:** 3 Days (CEU: 1.8 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course consists of a series of six modules that can be presented individually, or as an entire package, over a 3-day period. This course examines various aspects of design and operations and how they affect the safety of an intersection and its various users. The full course contains a total of six modules: Users and Intersections; Diagnostics and Countermeasures; Geometric Design; Unsignalized Intersections; Signalized Intersections and Case Studies. This course is designed to be interactive with numerous discussions, exercises and case studies.

Outcomes:

Upon completion of the course, participants will be able to:

- List the user groups to consider.
- Describe user characteristics and how they affect intersection design and safety.
- Describe approaches to balance needs of different user groups.
- Determine which intersections have poor crash experience.
- Assess causes of high crash experience or high potential.
- Describe how to select appropriate countermeasures.
- Define intersection design objectives, controls, and focus area.
- Identify key safety-related intersection geometric design decisions, applications, and assumptions.
- Describe the measured and potential safety improvements that result from key intersection geometrics.
- Describe safety issues at unsignalized intersections.
- Summarize MUTCD requirements for signaling an intersection.
- Select appropriate countermeasures to address safety issues at unsignalized intersections.
- Identify common safety concerns at signalized intersections.
- Discuss contributing factors to safety concerns.
- Select countermeasures to improve signalized intersection safety.

Target Audience:

The target audiences for the course are traffic engineers and transportation professionals with one to five years working experience.

Technical Information	Clayton Chen	(202) 366-4656 clayton.chen@fhwa.dot.gov
NHI Training Program Manager	Bill Williams	(703) 235-0539 bill.williams@fhwa.dot.gov

Highway Safety

Course Number: 380076A

Course Title: Low Cost Safety Improvements Workshop

Fee: \$200 Per Participant **Length:** 1 Day (CEU: 0.6 Units) **Class Size:** Minimum 20; Maximum 35

Description:

This course provides a comprehensive synthesis of low-cost, ready-to-use safety improvements. Workshop presents a synthesis of countermeasures and their associated Crash Reduction Factors as identified in the AASHTO Strategic Highway Safety Plan -- NCHRP 500 Guidebooks. Each participant will receive a copy of the NHI Low Cost Safety Improvements Workshop Participant Workbook as the course text.

Outcomes:

Upon completion of the course, participants will be able to:

- Identify appropriate engineering countermeasures from crash patterns.
- Recognize deficiencies in operation/design and select appropriate countermeasures for roadside hazards.
- Recognize deficiencies in safety performance of signing and markings and lighting and select appropriate countermeasures.
- Recognize deficiencies in operation/design of intersections and select appropriate countermeasures.
- Recognize deficiencies in operation/design of traffic signals and select appropriate countermeasures.
- Recognize deficiencies in operation/design of railroad grade crossings and select appropriate countermeasures.
- Illustrate new and innovative low cost safety improvement measures developed by State DOTs.

Target Audience:

Federal, State and local transportation, traffic and safety engineers, and planners involved in reducing intersection crashes.

Technical Information	Dean Larsen	(410) 962-2372 dean.larsen@fhwa.dot.gov
NHI Training Program Manager	Bill Williams	(703) 235-0539 bill.williams@fhwa.dot.gov

Highway Safety

Course Number: 380077A

Course Title: Intersection Safety Workshop

Fee: \$200 Per Participant **Length:** 1 Days (CEU: 0.6 Units) **Class Size:** Minimum 20; Maximum 30

Description:

The course provides ready-to-use direct-application safety measures for rural unsignalized intersections and for signalized intersections. Workshop presents a synthesis of countermeasures and their associated Crash Reduction Factors as identified in the AASHTO Strategic Highway Safety Plan - NCHRP 500 Guidebooks. Each participant will receive a copy of the NHI Intersection Safety Workshop Participant Workbook as the course text.

Outcomes:

Upon completion of the course, participants will be able to:

- Apply models (equations) to predict number of crashes for an intersection based upon traffic volumes.
- Identify high crash intersections and recognize appropriate engineering countermeasures.
- Identify Crash Reduction Factor / Crash Modification Factors associated with countermeasures.
- Describe safety performance of intersection geometric design features and the models to quantify the safety effect.
- List regulatory, warning and guide signing and markings countermeasures and associated safety benefits.
- List highway lighting countermeasures and associated safety benefits.
- List traffic signal countermeasures and associated safety benefits.

Target Audience:

Federal, State and local transportation, traffic and safety engineers and planners involved in reducing intersection crashes.

Technical Information	Fred Ranck	(708) 283-3545 fred.ranck@fhwa.dot.gov
NHI Training Program Manager	Bill Williams	(703) 235-0539 bill.williams@fhwa.dot.gov

Highway Safety

Course Number: 380078A

Course Title: Signalized Intersection Guidebook Workshop

Fee: \$200 Per Participant **Length:** 1 Day (CEU: 0.6 Units) **Class Size:** Minimum 20; Maximum 30

Description:

This course provides an overview of the new FHWA publication Signalized Intersections Informational Guide FHWA-HRT-04-091. Emphasis is on methods for evaluating the safety and operations of signalized intersections and tools to remedy deficiencies. Each participant will receive a copy of the FHWA Signalized Intersections Information Guide.

Outcomes:

Upon completion of the course, participants will be able to:

- Recognize and apply fundamentals of signalized intersections in terms of user needs, geometric design, traffic design and illumination.
- Describe signalized intersection project process, safety analysis methods and operational analysis methods.
- Describe the five types of signalized intersection treatments and their advantages and disadvantages.

Target Audience:

Federal, State and local transportation, traffic and safety engineers, and planners involved in planning, designing, operating and remedying crash problems for signalized intersections.

Technical Information	Fred Ranck	(708) 283-3545 fred.ranck@fhwa.dot.gov
NHI Training Program Manager	Bill Williams	(703) 235-0539 bill.williams@fhwa.dot.gov

New / Updated Courses

Course No.	Course Title	Status
Mathematical Sciences		
123002	Scientific Approaches to Transportation Research	New
Structures		
130082	LRFD for Highway Bridge Substructures and Earth Retaining Structures	New / Early '05
130088	Bridge Construction Inspection	New / Late '05
Geotechnical		
132078	Micropile Design and Construction	New / Late '05
Materials, Pavements and Base Design		
131100	Pavement Smoothness: Use of Inertial Profiler Measurements for Constructions Quality Control	New
131104	Integrating Preventative, Maintenance and Pavement Management Systems	New
134058	Alternative Contracting	New / Early '05
Intelligent Transportation Systems (ITS)		
137001C	ITS Awareness Seminar (computer)	New / Mid '05
137001	ITS Awareness Seminar (instructor led)	New
137002	Deploying Integrated ITS-Metropolitan	New
137042	Configuration Management for Transportation Management Systems	New / Early '05
133028	Traffic Signal Design and Operations	
139001	Integrating Freight in the Transportation Planning Process	New
139002	Multimodal Freight Forecasting	New / Early '05
Real Estate		
141030	Advanced Relocation	Updated
Environment		
142005	NEPA and Transportation Decision Making	Updated
142005C	NEPA and Transportation Decision Making (Tutorial)	New Mid '05
142036	Public Involvement in Transportation Decision Making	Updated
142042	Fundamentals of Title VI/Environmental Justice	Updated
142043	The CMAQ Program: Purpose and Practice	New
142044	Implications of Air Quality Planning for Transportation	New
142047	Water Quality Management of Highway Runoff	New
142049	Beyond Compliance: Historic Preservation in Transportation Project Development	New / Late 2005
142050	Context Sensitive Solutions	New / Late '05
142051	Highway Traffic Noise	New / Late '05
Planning		
151018	Application of the FHWA Traffic Monitoring Guide	Updated
151021	Administration of FHWA Planning Grants	Updated
151039	Applying GIS & Spatial Data Technologies to Transportation	New
151041	Linking Planning & NEPA	New
152071	Estimating Regional Mobile Source Emissions	New
Corporate Management		
310111	Conducting Reviews that Get Results	New
310113C	Advanced Federal aid Decision Making	New / Mid '05

Course No.			Course Title	Status
Highway Safety				
380071	Interactive Highway Safety Design Model			Early 2005
380072	Advanced Workzone Management and Design			Early 2005
380073	Fundamentals of Planning, Design & Approval of Interchange Improvements to the Interstate System			Early 2005
380074	Designing and Operating Intersection for Safety			Early 2005
380076	Low Cost Safety Improvements Workshop			Early 2005
380077	Intersection Safety Workshop			Early 2005
380078	Signalized Intersection Guidebook Workshop			Early 2005

As courses become available for scheduling, the course descriptions will be available on the NHI web site.

The graphic features two large, thin blue circles that overlap in the center. A thick, dark blue swoosh, resembling a stylized 'F' or a road, curves around the central intersection of the circles. The text 'Other FHWA Training' is positioned within the central area of the swoosh.

Other FHWA Training



FHWA Civil Rights Program Management

Length: 4.5 Days **Class Size:** 30

Description:

A basic, yet concentrated overview of the major FHWA civil rights programs and an introduction to the principles of complaints processing and investigation. The course focuses on authorities for each of the programs, as well as how to administer the programs at the Division Office and the State DOT levels, including development, review and approval of State program documents. The course is divided into six separate modules and reference manuals are provided for each module: State DOT Internal EEO/Affirmative Action, EEO Contractor Compliance, Investigation of Discrimination Complaints, Title VI/Environmental Justice, Disadvantaged Business Enterprise, and Americans with Disabilities Act.

Target Audience:

All FHWA, State DOT and other recipient personnel assigned civil rights responsibilities on either a full or part-time basis. In addition, FHWA Division Administrators, Assistant Division Administrators, Staff Officers and State DOT management personnel in any discipline with significant civil rights implications (e.g., planning, contract administration, legal, environment, safety, right-of-way and relocation, research). A minimum of 15, not to exceed 30, participants is required to hold a session.

Contact: Office of Civil Rights Humberto R. Martinez (817) 978-3671 humberto.martinez@fhwa.dot.gov

Construction of Pavement Subsurface Drainage Systems

Length: 1 Day **Class Size:** 35

Description:

This workshop provides participants with techniques for quality construction and maintenance of pavement drainage systems. It provides good guidance for the construction of permeable bases, aggregate separator layer and edgedrain systems. Inspection and maintenance of the system are also covered in the workshop.

Target Audience:

Pavement design engineers, construction and maintenance personnel.

Contact: Angel Correa (404) 562-3907 angel.correa@fhwa.dot.gov



HIPERPAV Workshop

Length: 1 Day **Class Size:** 35

Description:

HIPERPAV is a software program that models early-age development of concrete strength and stresses that result from moisture and temperature changes within the pavement. In this workshop the participants will become familiar with using the software and its capabilities to extend the useful life of concrete pavements.

Target Audience:

Pavement engineers, construction and maintenance personnel.

Contact: Angel Correa (404) 562-3907 angel.correa@fhwa.dot.gov

Highway Performance Monitoring System (HPMS) Software Workshop

Length: 2 Days

Description:

This workshop will provide hands-on instruction on the use of the newest HPMS software package. Workshops are offered on an as-needed basis.

Target Audience:

State and FHWA field personnel working with the HPMS data program and responsible for preparing or evaluating a State's HPMS submittal package.

Contact: Office of Highway Policy Information Thomas Roff (202) 366-5035 thomas.roff@fhwa.dot.gov

Highway Traffic Noise Analysis and Abatement Workshop

Length: 10 Hours (Two 5-hour days)

Description:

The workshop provides a basic understanding of highway traffic noise and FHWA's noise regulations. It addresses the following topics: basic acoustics, regulations, noise measurement, highway traffic noise prediction, noise mitigation, construction noise, and documentation of noise analysis.

Target Audience:

FHWA, State DOT, and MPO staff; other Federal, State, and local agency staff.

Contact: Office of Natural Environment Bob Armstrong (202) 366-2073 robert.armstrong@fhwa.dot.gov

Human Factors for Transportation Engineers

Length: 6.5 Hours **Class Size:** 20

Description:

This one-day workshop includes interactive modules on information reception, decision making, driver responses, and human factors principles. The relationship between specific highway standards and human needs is emphasized. Human skills and capabilities are discussed and demonstrated and micro-case studies are included to allow participants to apply the knowledge they have gained.

Outcomes: Upon completion of the course, participants will be able to:

- Recognize that Human Factors has a role in highway design, operations, and safety decisions.
- Describe Human Factors information that is included in today's guidelines and standards.
- Identify human capabilities needed for using roadways.
- Apply basic human factors principles to resolve issues related to highway design, operations, and safety.

Target Audience:

Traffic Engineers, Highway Designers, Traffic Safety Specialists.

Contact: FHWA, Office of Safety Erin Kenley (202) 366-8556 erin.kenley@fhwa.dot.gov

137035A - Fiber Optic Installation on Freeway Right-of-Way Workshop

Length: 2 Days **Class Size:** 20

Description:

This two-day workshop walks participants through project development, design and approval. Participants work with a scale model to see how and why project concepts and principals work together. The workshop is based on the "Design Guide for Fiber Optic Installation on Freeway Right-of-Way," a copy of which is provided to each participant.

Outcomes: Upon completion of the course, participants will be able to:

- Recognize the importance of shared resource agreements for installing fiber.
- Describe the issues associated with creating and administering a shared resource project.
- Appreciate the perspective of the telecommunication providers.
- Describe the impacts of fiber installation on corridor quality.
- Discuss the methods of installation.
- Delineate the steps and sequence in a fiber optics installation from project development through operations and maintenance.
- Navigate the "Design Guide for Fiber Optic Installation on Freeway Right-of-Way".

Target Audience:

The workshop is designed for both State DOT practitioners and telecommunication providers, and welcomes local transportation agency personnel.

Contact: Ron Giguere (202) 366-2203 ron.giguere@fhwa.dot.gov or William S. Jones (202) 366-2128 william.jones@fhwa.dot.gov



Preventing Discrimination in the Federal-Aid Program: A Systematic Interdisciplinary Approach

Length: 1.5 - 2 Days **Class Size:** 15

Description:

A presentation on the creation of a preventive, proactive and inter-disciplinary team strategy to implementing Title VI and Environmental Justice requirements. The inter-relationship between Title VI and Environmental Justice, as well as roles and responsibilities of program and civil rights officials are also covered. A comprehensive reference manual is provided to all participants. Note: In order for the course to be delivered effectively, an inter-disciplinary audience must be guaranteed, and a 1 to 2 hour Executive Session with the State DOT's Chief Administrative Officer and immediate staff must be scheduled on the day prior to the course.

Target Audience:

FHWA, State DOT, MPOs and other recipient personnel involved in the following fields: Civil Rights; Planning; Environment; Engineering and Construction; Right of Way and Relocation; Legal; Research; Contract Administration; or Social Science. In order to schedule a session, a minimum of 15, not to exceed 30, participants is required.

Contact: Headquarters Office of Civil Rights Humberto R. Martinez

TMIP Land Use Forecasting Seminar

Length: 1 Day

Description:

This course will be sponsored by the Travel Model Improvement Program (TMIP). The focus of the seminar is to discuss different methods used in socioeconomic and demographic forecasting, potential data sources and data reliability.

Target Audience:

MPO, DOT, transit agency planners.

Contact: Office of Metropolitan Planning Michael Culp (202) 366-9229 michael.culp@fhwa.dot.gov

Pavement Life-Cycle Cost Analysis (LCCA) Software Workshop

Length: 12 Hours **Class Size:** 10

The recipients provide the training facility.

Description:

This workshop provides instruction on life-cycle cost analysis for pavement design and on the FHWA's pavement Life-Cycle Cost (LCCA) software product. Attendees learn about LCCA, user costs, and probability and risk analysis. Several exercises provide hands-on instruction in how to use the software.

Target Audience:

State DOT pavement design and materials engineers and those who make pavement materials selection decisions.

Contact: Office of Asset Management Keith Goodman (202) 366-2171 keith.goodman@fhwa.dot.gov



Prestressed Concrete Beam Design Workshop: Load and Resistance Factor Design

Length: 2.5 Days **Class Size:** 30

Description:

This workshop is an introduction to the design of precast prestressed pretensioned concrete beams for bridges using the AASHTO Load and Resistance Factor Design (LRFD) Specifications. The goals of this workshop are to introduce the LRFD specification provisions for common types of prestressed concrete beams and provide hands-on interactive training using design examples and exercises. Time is provided for the host agency to present local LRFD implementation and design practices. The participant's workbook includes copies of the presentation slides, exercise worksheets and a design example of a simple span prestressed concrete beam.

Target Audience:

The primary audience is agency and consultant structural designers. The workshop is intended for engineers who are familiar with the AASHTO Standard Specifications for Highway Bridges and have designed at least two bridges.

Contact: Office of Structural Design Engineer Jeff Smith (404) 562-3905 jeff.smith@fhwa.dot.gov

TMIP Travel Model Calibration and Validation Seminar

Length: 1 Day

Description:

This course will be sponsored by the Travel Model Improvement Program (TMIP) and will be based on the new TMIP publication, Model Validation and Reasonableness Checking Manual. The focus will be on step-by-step fundamentals of calibrating and validating base year models and reasonableness checks for forecasts.

Target Audience:

MPO, DOT, transit agency planners.

Contact: Office of Interstate & Border Planning Michael Culp (202) 366-9229 michael.culp@fhwa.dot.gov



Transportation Air Pollutant Modeling and Estimating

Length: 1.5 Days **Class Size:** 15

Description:

This course provides fundamental training on the use of CALME4 and CAL3QHC to estimate air pollutant concentrations near roadway (both intersections and linear roadway). The course will cover both the fundamental theory and the software application techniques. Participants will be able to code and run real case study examples.

Target Audience:

MPO, DOT, transit agency planners, State DOT and any other transportation project development sponsors involved in the transportation NEPA process.

Contact: Southern Resource Center Michael Roberts (404) 562-3928 michael.roberts@fhwa.dot.gov or Tianjia Tang (404) 562-3673 tianjia.tang@fhwa.dot.gov

Transportation Air Quality Dispersion Modeling

Length: 1.5 Days **Class Size:** 15

Description:

This course covers both the fundamentals and practices of CAL3QHC dispersion modeling program. In the first module, both dispersion and traffic movement theories will be taught. There are seven sections in the practice module. These seven sections cover materials ranging from data collection, data compilation, program runs, to results interpretation. There are eight hands-on exercises in this section. The last module is policy guidance related to hot spot analysis. By successfully completion of the course, participants shall be able to conduct quality dispersion modeling and analysis independently.

Target Audience:

MPO, DOT, transit agency planners, State DOT and any other transportation project development sponsors involved in the transportation NEPA process.

Contact: Southern Resource Center Tianjia Tang (404) 562-3673 tianjia.tang@fhwa.dot.gov



Nondestructive and Innovative Testing Workshop for Concrete

Length: 2 Days **Class Size:** 35

Description:

The workshop provides participants an overview and theory of the most commonly used nondestructive techniques for measuring the early age properties of concrete. The workshop includes several hands-on modules where the participants will have an opportunity to use the equipment on concrete specimens to gain a better understanding on its operation and analysis of results. The workshop also discusses some emerging technologies and current research activities that might have an effect on the state of the practice.

Target Audience:

Pavement engineers, research engineers, senior technicians, construction and maintenance personnel, contractors, consultants, and academia responsible for the conduct of materials testing to assess concrete performance.

Contact: Office of Pavement Technology Gary Crawford (202) 366-1286 gary.crawford@fhwa.dot.gov

Vehicle Travel Information System (VTRIS) Workshop

Length: 1day **Class Size:** 20

Description:

This workshop provides hands-on instruction on the use of the stand-alone VTRIS software and the web version of the VTRIS application, which is used for processing automatic vehicle classification (AVC) and weigh-in-motion (WIM) data for the Truck Weight Study (TWS). Principles of the Traffic Monitoring Guide (TMG) are covered that relate to AVC and WIM programs. Workshops are offered on an as-needed basis.

Target Audience:

State, Federal, Local and private companies working the State agencies to analyze and submit AVC and WIM data for the TWS.

Contact: Office of Policy David Jones, Sr. (202) 366-5053 david.jones@fhwa.dot.gov



Best Practices for PCC Pavements: Long-Life PCCP Design and Construction Features Workshop

Length: 1 – 2 days **Class Size:** 30

Description:

This is the first workshop in a series with 2 others currently under development. The workshop covers a range of topics including pavement design, concrete materials and mix designs, construction process and management aides, alternate design and bid approaches, and maintenance, repair and rehabilitation. The workshop is available upon request.

Target Audience:

The workshop can be tailored for State DOT pavement and materials engineers, consulting design engineers, paving contractors and independent testing/inspection laboratories.

Contact: Office of Pavement Technology Sam Tyson (202) 366-1326 sam.tyson@fhwa.dot.gov

Transportation Air Quality (Project Level-Hot Spot) Modeling and Analysis

Length: 2 Days **Class Size:** 30

Description:

This course covers both the fundamental aspects and practices of CAL3QHC dispersion modeling program used in SIP/Conformity and NEPA project development processes. In module A, both dispersion and traffic movement theories are taught. There are seven sections in module B. These seven sections cover materials ranging from data collection, data compilation, program runs, result interpretation and regulatory guidance. Methods to code various intersection/interchange links are covered. Signal timing and phasing are covered in module B, too. There are eight hands-on exercises in module B. By successfully completion of the course, participants shall be able to conduct air quality dispersion modeling and analysis independently.

Target Audience:

The course is for all State and local government agencies and private consultants actively working on public projects.

Contact: Southern Resource Center Tianjia Tang, Ph.D., PE. (410) 962-2177 tianjia.tang@fhwa.dot.gov



Transportation Air Quality Fundamental (AQ101)

Length: 2 Days Class Size: 30

Description:

This course provides a comprehensive overview and analysis on related scientific principle, law/regulation, and current practices in transportation air quality. Its breadth-and-depth coverage will benefit both policy makers and technical practitioners. Thirteen chapters give not only a complete picture of air quality, but also the detailed step-by-step real world project/program practices. The material can be also used as references and guides for practicing professional. Over 100 exercises with answers are provided to enhance participant's understanding of the material

Course Includes:

1.Atmospheric Physics; 2.Atmospheric Chemistry; 3.Meteorology; 4.Emission/Pollutant; 5.Federal Air Quality Legislation History; 6.Legal Obligation: NAAQS, air monitoring, and nonattainment designation; 7.Legal Obligation: State Implementation Plan; 8.Legal Obligation: Transportation Conformity; 9.Tools Required: Emission factor (EF) modeling; 10.Tools Required: Regional Transportation Modeling and Analysis; 11.Tools Required: Project level concentration modeling and methodology; 12.Congestion Mitigation and Air Quality Improvement Program; 13. Mobile Source Air Toxic

Target Audience:

The course is for all State and local government agencies and private consultants actively working on public projects.

Contact: Southern Resource Center Tianjia Tang (410) 962-2177 tianjia.tang@fhwa.dot.gov

TMOBILE6.2: Motor Vehicle Emission Factor Modeling

Length: 2 Days **Class Size:** 30

Description:

This course covers the latest EPA motor vehicle emission factor-modeling program – MOBILE6.2. The first module of the course covers the fundamentals of MOBILE6. Topics ranging from base line emission estimate, Federal Testing Procedure, to Facility Cycle are taught. The practice module, which is the main focus of this introductory course, contains eight sections. In the practice module, participants will learn how to formulate a scenario, develop an input file with both required and optional commands, use external data files, run program, and interpret results. There are ten hands-on exercises in module B. After successful completion of this course, participants will establish a firm understanding of the MOBILE program and be able to conduct effective data and program review / evaluation and basic emission factor modeling and analysis.

The course also covers the latest MOBILE6.2's particulate matter (PM) and air toxic emission factor modeling. The AP42 methods for both paved and unpaved road re-entrained dust emission estimation are covered.

Target Audience:

This course is for all State and local government agencies and private consultants actively working on public projects.

Contact: Tianjia Tang (410) 962-2177 tianjia.tang@fhwa.dot.gov

Activity and Tour Based Forecasting Seminar

Length: 1 Day **Class Size:** 30

Description:

The Activity and Tour Based Forecasting Seminar is designed for travel demand modelers with several years of practical experience. The development of activity and tour-based models is a result of recent research into travel demand forecasting procedures and advances in computing technology, which enable more detailed and disaggregate travel demand analysis. The seminar attempts to communicate to travel modeling professionals some of the activity and tour-based modeling procedures developed by their colleagues around the U.S. and abroad, as well as promising techniques that have been or are being researched.

Target Audience:

MPO, DOTR, transit agency planners

Contact: Penelope Weinberger (202) 366-4054 p-weinberger@tamu.edu



137036A - ITS Foundation

Length: 4 Days **Class Size:** 30

Description:

The foundation course provides Federal staff with basic knowledge and skills in the core areas for Intelligent Transportation Systems (ITS). Elements of the ten “core” courses found in the ITS Professional Capacity Building (PCB) curriculum are incorporated in the Foundation course. The courses are: Deploying ITS - Metropolitan (137002), ITS Public/Private Partnerships (137003), ITS Telecommunication Overview (137005), Rural ITS Toolbox (137007), Using the National ITS Architecture for Deployment (137013), ITS Software Acquisition (137019), ITS Procurement (137020), Introduction to Systems Engineering (137024), ITS Standards Overview (137038), Managing High Technology Projects for Transportation (137026), and Managing Incidents and Roadway Emergencies (133048). There will be a module that addresses current policies and initiatives in ITS. Also, there will be a primer on the eligibility of federal-aid funds for ITS deployment. A team of existing course instructors, and a number of Federal ITS officials will present the course.

Note: The Foundation Course should not be considered a substitute for any of the core courses. Typically, the core subjects are presented at a high level in the Foundation Course. ITS specialists should plan on taking most, or all, of the individual core courses in order to develop the appropriate knowledge and skills needed for their jobs.

Target Audience:

This course is intended for FHWA, FTA, and FMCSA headquarters and field staff. It is of considerable value to ITS specialists with limited experience and/or incomplete core knowledge in ITS. In addition, non-specialists in ITS, as well as those peripherally involved with ITS, could gain valuable knowledge and insight from attending this course.

Contact: Ron Giguere (202) 366-2203 ron.giguere@fhwa.dot.gov



Designing Pedestrian Facilities for Accessibility

Length: 1, 1.5, or 2 Days **Class Size:** 35

Description:

This course, developed by the Federal Highway Administration (FHWA), provides an overview of the Americans with Disabilities Act (ADA) and teaches participants how to apply appropriate guidelines and policies to the public rights-of-way. The following areas are covered:

- Background to the Americans with Disabilities Act (ADA)
- Characteristics of pedestrians and the pedestrian environment
- Legal requirements
- U.S. D.O.T. and FHWA policies and funding opportunities
- Accessible design elements – sidewalk corridor, frontage corridor, and pedestrian zone
- Curb ramps
- Crosswalks
- Medians & islands
- Roundabouts
- Overpasses and underpasses
- Temporary facilities and construction site safety
- Pedestrian signs and signals

In addition to the instruction, the 1.5 and 2-day versions of the course include a field exercise in which participants use wheelchairs and blindfolds to navigate and evaluate several sidewalk and street crossing locations.

Target Audience:

Local, State, and Federal engineers and planners with responsibility for designing and/or building pedestrian facilities; urban designers; public officials; interested citizens.

Note: This course is being taught by the Association of Pedestrian and Bicycle Professionals (APBP). There is a fee for hosting the course: \$3250/\$4000/\$4500.

Contact: Aida Berkovitz (415) 744-2614 aida.berkovitz@fhwa.dot.gov



Registration and Coordination

Registration and Coordination

This section contains information about course registration, fees, and the award of Continuing Education Units (CEUs).

1. Course Requests/Scheduling

- a. To host NHI courses, the On-Site Course Request, FHWA Form 1530, should be submitted through the NHI web site or by FAX. A copy of this form is also included in the back of this catalog and may be faxed to the NHI Training Coordinator at 703-235-0577. **Desired dates may be shown on the form, but courses are not officially confirmed until the hosting organization receives confirmation from NHI.** After the On-Site Course Request is received, an instructor will contact the Local Coordinator to discuss scheduling. After NHI confirms the course, the host will receive confirmation, the local FHWA division office coordinator will be notified and the course will be listed on the NHI web site.
- b. Please identify the number of seats that may be sold to the public on the On-Site Course Request. These seats will be listed on the NHI web site. Seats sold through the web site will not appear on your final invoice.
- c. To register for distance learning courses visit the NHI web site. On-line registration for distance learning courses requires MS Internet Explorer (IE) 5.0 or higher.

2. Course Fees for Government Hosts

Course Length		Per Person Fee
1	Day	\$ 200.00
1.5	Days	\$ 235.00
2	Days	\$ 270.00
2.5	Days	\$ 335.00
3	Days	\$ 400.00
3.5	Days	\$ 460.00
4	Days	\$ 530.00
4.5	Days	\$ 600.00
5	Days	\$ 650.00
10	Days	\$1,400.00

NHI's course fees are based on \$200 per participant per day and include course materials for each participant. A minimum number of 20 paid participants are required to hold a class.

Fees for distance learning courses vary from course to course. Please refer to the course information found in the NHI training course description.

Note: Hosts are not charged for FHWA personnel attending NHI classes.

Note: We will continue to recover the full cost of delivery for international presentations. These will be handled on a case-by-case basis.

Course hosts may charge participants from outside their organizations a fee in order to recover all or part of the NHI course fee, plus other costs associated with hosting the course. Checks, money orders or other generally accepted forms of payment from individual course participants will be accepted as part of the course fee, so long as they are made payable to the *Federal Highway Administration*. Such payments may be forwarded to NHI as soon as they are received with the amount of the invoice reduced accordingly; or they can be held and submitted as part of the total payment upon invoice to the hosting organization.



3. Course Fees for Non-Government Hosts

Non-government organizations that plan to host a course should contact NHI to discuss requirements and fees.

4. Course Registration

a. Domestic Customers

Employees of the host agency should contact the local coordinator for registration. All others, except FHWA employees, may register through the NHI web site. Visa, MasterCard, and Discover are acceptable forms of credit. To make additional payment arrangements such as checks and purchase orders please contact the NHI Training Coordinator at 703-235-0528.

b. FHWA Employees

As NHI training is provided to hosting government agencies at a subsidized rate, space for up to 3 participants is reserved for FHWA employees. NHI courses are considered internal training for FHWA and consequently there is no charge for FHWA employees. FHWA employees should use the following procedure to attend NHI courses:

- i. The FHWA Course Coordinator in the State/Division Office controls registration of FHWA employees' attendance in NHI courses. The names of the coordinators can be accessed through the NHI web site. **FHWA employees should enroll in NHI courses using the FHWA learning management system. Do NOT contact the Local Coordinator directly.**
- ii. If the FHWA spaces are not filled within three weeks of the course starting date, the hosting organization may fill these spaces with other participants.

c. International Customers

NHI will arrange the participation of international customers in training courses in the United States. In addition, NHI provides assistance to international organizations wishing to purchase standard NHI training courses on a variety of technical subjects. These courses can be tailored to the specific needs of the organization at an additional cost. For more information about training courses for international participants, please contact Roger Dean at (703) 235-0550 or by e-mail: roger.dean@fhwa.dot.gov.

5. Payment

a. Domestic Customers

NHI invoices the hosting organization upon completion of the course. Payment may be made to NHI by check, money order or credit card. Checks and money orders should be made payable to the *Federal Highway Administration*. Credit card payments are accepted by contacting the NHI Training Coordinator.

b. International Customers

NHI will fax an invoice to the individual or organization upon completion of the course. Cashiers' checks, international money orders, and credit cards are accepted forms of payment. Special arrangements will have to be made for wire transfers, and customers must ensure that they pay all related bank fees. All cashiers' checks and international money orders should be payable in U.S. dollars to the *Federal Highway Administration*.



c. Distance Learning Courses

NHI accepts checks, purchase orders and credit cards as payment for distance learning courses. FHWA employees may take distance learning courses free of charge. Follow the on-line screen instructions when registering through the NHI web site. For additional information, please contact the NHI Training Coordinator at (703) 235-0528, (703) 235-0577 (fax), or NHITraining@fhwa.dot.gov.

6. Course Cancellation Policy

The host of an NHI course must contact the NHI Training Coordinator to cancel a course. Cancellation is requested no later than seven days prior to the course start date to avoid incurring any fees. If the course materials have been sent, the host must return the materials to the FHWA Report Center.

7. Refunds

A refund may be obtained for a distance-learning course within 72 hours after a user has paid for the class. Please submit an e-mail request for refund to the NHI Training Coordinator. Your reimbursement will be processed as quickly as possible. Credit card reimbursements should appear within two billing cycles. A credit to attend another NHI course will be issued if payment was made by check.

8. Participants and Hosts

Hosts of NHI courses are encouraged to survey the training needs of entities outside their own organization while they determine their internal training needs. In some cases, the combined needs may warrant hosting a course for which there otherwise would not be sufficient interest. By attending training together, all parties receive the same training, benefit from the breadth of experience added to classroom discussions, and participants increase their understanding of each other's perspectives by working together on class exercises.

9. CEUs and PDHs

The course descriptions include Continuing Education Units (CEUs) that will be awarded to course participants who successfully complete NHI courses. According to the International Association for Continuing Education and Training (IACET): One Continuing Education Unit (CEU) is ten contact hours of participation in an organized continuing education experience under responsible sponsorship, capable direction, and qualified instruction.

The CEUs are based on a typical course presentation with 6 hours of actual instruction time, i.e., 0.6 CEUs, per day. Adjustments to the course length to match local work hours or to accommodate increased/decreased emphasis on certain topics or for travel on field trips may affect the actual number of CEUs awarded. CEUs will be awarded only to those participants who are present for the full course.

Some states and organizations use Professional Development Hours (PDHs) to track training. Each hour of instruction is worth one professional development hour.

10. Local Coordinators' Checklist

Everyone has attended training sessions where the instructor could not find the chalk, or the eraser; or the room was too hot or too cold; or there was not enough room for the number of participants scheduled for the course. The following checklist provides a suggested step-by-step process for those who are setting up the training site.



Checklist

1. Request for Training

Following the instructions on the form, send a completed On-Site Course Request form to NHI. Please furnish a copy to the local FHWA Division Office once NHI has approved the requested dates (Government hosts only).

2. Training Site

- Select a room that will not be overcrowded, too hot or too cold, or subject to outside distractions. The instructor should provide you with any unique requirements for the training facilities.
- Reserve a training room for the duration of the course.
- Determine if books and equipment can be left in the room. Training courses, requiring special equipment or computers, need after-hours security.
- Visit the classroom to make certain it meets all of the instructor's requirements.
- Other considerations for a training room
 - Heat or air conditioning - find out if the instructor can control these
 - Adequate size and shape. No poles or obstructions
 - Special arrangements for demonstrations, labs, and experiments
 - Seating arrangements
 - Away from kitchen, construction area or other noise distractions
 - Electrical outlets.
 - Adequate Ventilation
 - Lighting controls - Almost every training course uses visual aids that require a projection screen. It is important to have a room where lighting can be controlled to prevent glare on the screen while not placing the room in total darkness.
- Consider the following points for using visual aids
 - Will shades completely darken all windows?
 - Can the lights be selectively dimmed when showing slides or viewgraphs?
 - Will overhead lights shine directly on the screen?
 - Can a bulb be removed above the screen or will the blackboard be too dark?

3. Participants and Instructors

- If needed, reserve a block of hotel/motel rooms for the course participants and instructors. Some hotels will provide a free meeting room if a minimum number of participants stay at the hotel.
 - Participants and instructors should be
 - Informed of course starting and ending times
 - Advised on hotel accommodations and room rates, checkout times
 - Furnished with maps
 - Advised on parking arrangements

4. Equipment Needs

- Nothing is more frustrating to the instructor and annoying to the participants than a computer that will not work or a VCR that will not play
 - The instructor will tell you what equipment is needed, in addition to normal items such as:
 - Videotape player
 - Blackboard with chalk and eraser or whiteboard with drimark pens and eraser

- Easel with flip chart paper and various colored markers
- Lectern or instructor table
- Extension cords
- Masking tape
- Course specific equipment may include
 - Slide projector with spare bulb and remote control extension
 - Overhead projector with spare bulb
 - Marking pens in various colors
 - Computers
 - LCD projection equipment with cables
 - Screen -- 6' x 6' or larger
- Check all equipment to ensure that it is working satisfactorily.

Final Arrangements

1. Two Weeks Before The Course

- Make sure an approved copy of the On-Site Course Request has been received. If not, call the NHI Training Coordinator at (703) 235-0528.
- Check that all training materials have arrived.
- Participant notebooks
- Tent cards (large felt tip markers will be needed)
- Evaluation forms
- Class roster form
- Certificates
- Other Checks:
 - Reconfirm the training facilities
 - Discuss the seating arrangements and who will set up the room
 - Determine when the room is unlocked/locked
 - Determine whether a technician is available in case of problems setting up the room or if something goes wrong during the course

2. One Week Before The Course

- Prepare directional signs to classroom
- No smoking in the classroom signs should be posted or written on the blackboard
- Find out where smoking areas are located
- Determine if snacks are available
- Identify where telephones are--both for participants to make outgoing calls and to receive incoming messages
- Pass out a list of eating places for lunch, along with a map
- Decide who will welcome the participants and introduce the instructors
- Special check out arrangements may be made to coincide with the course completion time
- Determine who will prepare the certificates of training and who will pass them out

3. One Day Before The Course

- Set up the classroom
- Organize the participant material
- Post directional signs
- Test all equipment



4. During The Course

- Let the instructor know whom to contact if he/she needs assistance
- Provide an accurate copy of the class participant roster to the instructor
- Prepare certificates of training. The time needed to prepare them may be reduced and the appearance improved by using a computer with a graphics program and a laser printer.
- Check with the instructor at least once a day to resolve any problems

5. After The Course

Make certain the instructor has the class roster, course evaluation forms, and application forms for CEUs . The instructor is responsible for sending these items to NHI. We hope these suggestions make the job of coordinating NHI courses easier and maximize training benefits.





U.S. Department of Transportation
Federal Highway Administration

NATIONAL HIGHWAY INSTITUTE ON-SITE COURSE REQUEST



National Highway Institute
4600 N. Fairfax Dr.
Suite 800
Arlington, VA 22203

Fax this Form to the Training Coordinator at (703) 235-0577

Section A - COURSE REQUEST

1. Course Information

Course Number Course Title
Length (days) Fee \$ ☐ Per Participant ☐ Per Course Public Seats

2. Training Location

City State

3. Requested Date Alternate Dates

4. Hosting Agency

5. Local Coordinator

Name
Street
City State Zip
Phone Fax
Email

6. Shipping Address for Materials

(Please list Street Addresses only)

Name
Street
City State Zip
Phone

7. Billing Address

Name
Street
City State Zip
Phone Fax
Email

8. Requesting Official (if different from Local Coordinator)

Name
Title
Phone Fax
Email
Signature _____ Date _____

X

Section B - CONFIRMATION

1. Confirmed Course Date 2. Contractor

3. Instructor

Name Phone Fax
Email

4. NHI Training Program Manager

Name
Email
Phone Fax (703) 235-0593

5. Authorizing Official

Name
Email NHITraining@fhwa.dot.gov
Phone (703) 235-0528 Fax (703) 235-0577
Signature _____ Date _____

X

SPECIAL NOTE: The course material will be shipped directly to the local coordinator unless we are requested to do otherwise. The local coordinator should use the packing list enclosed with each shipment to inventory the material immediately upon receipt. If the course material has not arrived 2 weeks prior to the scheduled presentation or if there are any questions on the arrangements, the local coordinator should contact the NHI Training Program Manager listed in Section B.

Form FHWA-1530

Training Coordinator (703) 235-0528 Fax (703) 235-0593 Email NHITraining@fhwa.dot.gov
www.nhi.fhwa.dot.gov

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